ASTP-Proton SURVEY REPORT

Fiscal Year 2014

ASTPPROTON

KNOWLEDGE TRANSFER EUROPE

Table of contents

I. Presentation of the Survey

The ASTP-Proton survey is the result of the hard work and commitment of several volunteers who collected and analyzed information from an increasing number of universities and research institutions all over Europe.

We are grateful for the support of our members from several national knowledge and technology transfer associations and the corresponding National Associations Advisory Committee (NAAC) which has been instrumental in achieving a steep increase in survey participation and availability of data.

With our survey combined with the strong support by national organizations we were able to collect data from 369 respondents – the largest dataset so far.

We are proud of such a strong support that underlines both the willingness to share information and the interest in receiving an overview of actual knowledge and technology transfer data.

Based on the increasing number of respondents and consequent data set we may in the future be in the position to analyze changes over time or regional differences and provide such additional information to our stakeholders.

We encourage our readers of this report and representatives of national organizations to also participate in and support our next ASTP-Proton survey. We aim at increasing the participation and strengthening our cooperation with national organizations to achieve the best possible regional coverage, data completeness and quality as well as harmonized definitions. These elements are prerequisites for meaningful conclusions and significantly impact the overall quality of our future reports.

It is an honor for ASTP-Proton to provide our members, contributors and stakeholders with the results of our fiscal year 2014 (FY 2014) survey and serve the desire to be informed about the status of the European knowledge and technology transfer activities.

Sincerely,

Marta Catarino
President ASTP-Proton

II. Executive Summary

Knowledge and technology transfer has become increasingly important both on a national and European level to bring innovative products and services efficiently to the market for the economic and societal benefit of Europe. The main purpose of this report is to provide an overview of relevant metrics and performance indicators for the knowledge and technology transfer industry on a pan-European level. The FY 2014 ASTP-Proton survey addressed European public research organizations especially including universities ("PROs") of which 369 provided valid responses that were analyzed and included in this report. The report is based on direct responses to the ASTP-Proton Survey FY 2014 and additional data provided by several national organizations that collected corresponding national data.

As response rates and data availability vary greatly from country to country some of the findings in this report may not be representative for a specific region. In addition the response rate varied significantly from subject to subject so that the results are based on larger or smaller groups of knowledge and technology transfer offices ("KTOs") of PROs. Lacking stringent supportive data for normalization we are currently not able to provide such data for comparison purposes but rather provide average non-normalized results.
Nevertheless, we base our report on a significant European sample and the largest pan-European data collection and analysis with the intent to even further increase our reach and completeness in data collection to become the source of choice for data on European knowledge and technology transfer activities and output.

This report was sent out to all participating entities and will be available on request for other interested parties via a download link on ASTP-Proton's webpage from January 1st, 2017. The executive summary is immediately available on the ASTP-Proton website.

The information provided in this report spans staffing aspects and outsourcing activities of KTOs, invention disclosures and patenting activities, commercial agreements and spin-off creation.

The following summary of aggregate figures for different subjects will be discussed in more detail in the following chapters. While the survey is based on 369 responding PRO or corresponding KTOs not all responding entities have entered data for each subject so that the aggregate numbers shown below are based on varying numbers of respondents to the specific subject (numbers of respondents in brackets):

KTO and PRO metrics:
1,673.11 KTO FTEs (200 respondents)98,156,570 Euro in combined KTO budget (141 respondents)
18.44 billion Euro in combined Research Budget of PROs served by KTO) (329 respondents)

IP metrics:
6,605 invention disclosures (342 respondents)
2,060 new patent applications filed (184 respondents)
1,311 patents granted (176 respondents)
13,997 active patent families at the end of FY 2014 (175 respondents)

Contracts and license income metrics:
31,982 contract research agreements concluded (256 respondents)
4,211 collaboration agreements concluded (105 respondents)
109,286 consultancy agreements signed (248 respondents)
110 option agreements executed (109 respondents)
173 assignment agreements concluded (105 respondents)
9,442 license agreements executed (281 respondents)
4,999 software agreements executed (152 respondents)

Spin-off and Start-up metrics:
355 new spin-offs formed (179 respondents)
331 new start-ups formed (96 respondents)

In the following sections we will report more in detail about the applied methodology and the results of our data analysis which we hope will be very insightful and provide some interesting overview of the activities and results of the European knowledge and technology transfer.

III. Introduction and Survey Methodology

Set-up of the FY 2014 survey

For FY 2014, ASTP-Proton had to make a difficult decision regarding surveys. The merger parties ASTP and ProtonEurope each performed their own survey prior to the merger and, when comparing the two surveys, it became apparent that there were numerous differences between the data sets that were collected, as well as in the definitions that were used in the two surveys.

As merging the questionnaires of ASTP and ProtonEurope appeared to be difficult to the point of being unworkable, this situation could be resolved in one of two obvious ways: selection of either the ASTP or ProtonEurope survey as the survey to take forward or – as ASTP-Proton has eventually chosen to do – break with the past and define a new set of survey data types and definitions.

A new survey questionnaire was developed that built on the 2009 report "Metrics for Knowledge Transfer from Public Research Organisations in Europe" by the European Commission's Expert Group on Knowledge Transfer Metrics[1] (please see Appendix A for a copy of the FY 2014 questionnaire).

While having some obvious drawbacks such as the potential inability (for some metrics) to compare survey data with those obtained in previous years, settling on a new set of metrics that was developed at the European level, independently of either ASTP or ProtonEurope, has the potential of unifying the kinds of metrics that are being tracked by KTOs and other stakeholders Europe-wide.

There is a particular need for such unification as surveys performed on a national scale in Europe can differ greatly in the kind of data that are requested or the definitions of certain terms used in the surveys.

A problem that is often encountered is that KTOs only track those data that need to go into the national survey. KTOs don't have much capacity to track additional data or fill out multiple surveys that demand different data sets to be submitted.

ASTP-Proton wishes to drive the convergence of knowledge and technology transfer survey metrics in Europe by adhering to a single set of metrics that was established independently.

Data Collection

Data collection was launched on 29 September 2015 and, at the request of a number of contributing national associations, was continued until early February 2016.

[1] EC, *Metrics for Knowledge Transfer from Public Research Organisations in Europe*, Report from the European Commission's Expert Group on Knowledge Transfer Metrics, Brussels, 2009 (available at http://ec.europa.eu/invest-in-research/index_en.htm).

The national professional associations in Europe were contacted through their representatives in the National Associations Advisory Committee (NAAC) and asked to either distribute the ASTP-Proton survey and help collect data on a national scale or – where such national associations organize their own survey – to contribute data from such surveys to the ASTP-Proton dataset for FY 2014. In the latter case, care was taken to only include compatible data in this analysis.

The FY 2014 survey was sent to:

- ASTP-Proton members
- KTOs present in the ASTP-Proton survey database
  and
- National Associations (NAs) for knowledge and technology transfer in Europe

Respondents

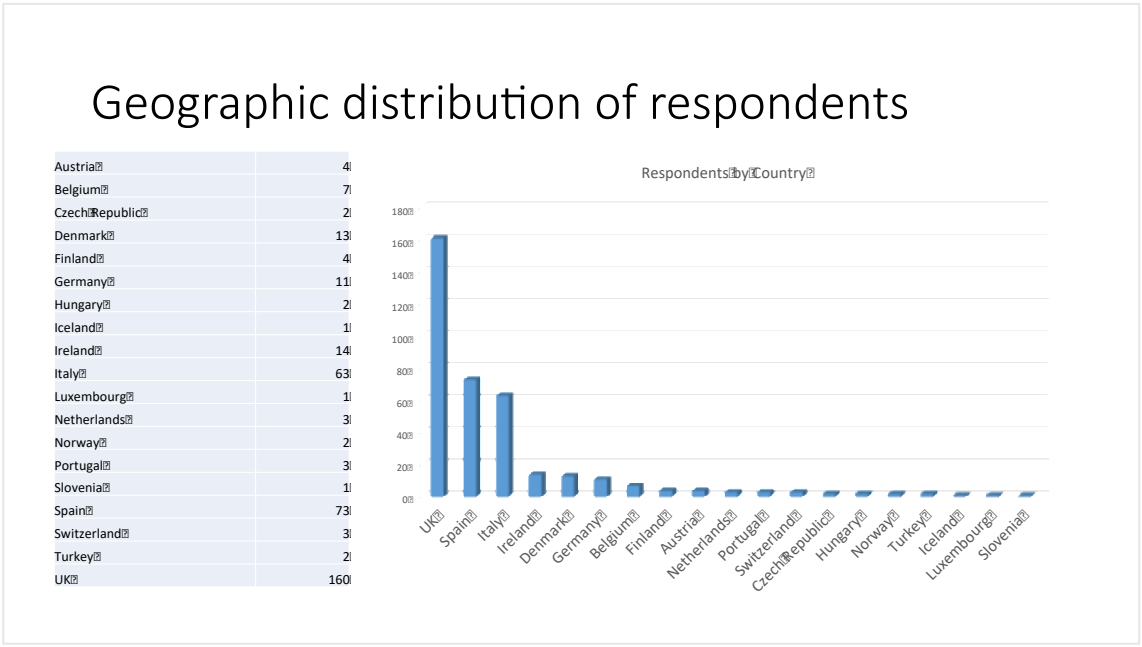
ASTP-Proton collected data from a total of 369 PROs or KTOs[2].

While most respondents either filled out the online ASTP-Proton survey through SurveyMonkey or completed the interactive pdf report, a significant fraction of the data was obtained from National Associations who sent ASTP-Proton the results of their national survey (not all national associations use the ASTP-Proton survey when polling their members). If different from the ASTP-Proton survey, such national surveys were checked for compatibility with the ASTP-Proton questionnaire, for instance on the use of identical definitions. Unless otherwise explicitly mentioned in the respective section of this report, only data that were considered to be compatible with data obtained through the ASTP-Proton survey were used in this report. This has sometimes led to the absence of data from certain countries for particular survey questions or occasionally for entire sections of the survey.

The number of responses varied greatly from country to country. For a few countries, thanks to the help of national organizations (e.g. HEFCE (UK); RedOTRI (Spain); Netval (Italy); Universities Denmark and IKTIG (Ireland)) we received data for most if not all KTOs/PROs. For most other countries we received a decent number of responses, though possibly not for the majority of the total number of KTOs/PROs within those countries. As we do not currently have a complete overview of all KTOs/PROs within Europe, we have no way of putting a definitive number on the relative response rate for any country or for Europe as a whole.

[2] Some KTOs service several PROs and thus report combined figures for such PROs.

For some countries we were ultimately unsuccessful in collecting data. The figure below gives an overview of the number of responses by country and the distribution of responses across countries.



It is also important to note that not all respondents replied to all the questions. In fact, for the large majority of respondents data for at least one of the questions were lacking. Therefore, the number of responses will vary from question to question and are being provided throughout the report for reference.

Data quality

Data cleaning was performed and unreliable data (extreme outliers) were flagged up in the survey database and excluded from the data analysis. Where mistakes in data entry were obvious (e.g. research expenditure entered as '55' and the likely actual number of 55 million was reasonable in view of the number of research FTE reported), such data were corrected. In all other cases, results were eliminated from the analysis. Four double entries (where the KTO in question had responded directly to the ASTP-Proton survey but also indirectly contributed data to the survey database via e.g. a National Association) were removed.

IV. Data and Analysis

The following chapters will provide a summary of the raw data analysis of a series of questions regarding KTOs and PROs, their intellectual property management, commercialization activities and spin-off/start-up creation efforts together with some interesting findings.

1) Knowledge and Technology Transfer Offices

In this survey for the FY 2014, the first set of questions (from 1 to 17) relate to indicators of the knowledge and technology transfer offices, their staffing levels, composition, financing and the organization of their day-to-day activity. Not all of the 369 overall survey respondents completed all of the questions in this section. Therefore, the number of responses on which we base the following analysis vary from question to question. Nonetheless, the following analysis is based on a significant sample.

One outcome of the survey is that the total number of full time equivalents (FTEs) involved in knowledge and technology transfer reported in FY 2014 was 1,673 (N=200), with a minimum of 0.25 FTE and a maximum of 77 FTE and an average FTE number of 8.4 per KTO.

The composition of European KTOs appears to be diverse. Table 1 shows the composition of KTOs in terms of FTE, with the number of respondents per category in brackets. One note of caution is needed in reading such data, since values are expressed as the number of FTEs and do not represent an actual headcount. Given the fact that many part-time positions were reported, it is likely that the number of people actually employed in European KTOs is significantly larger than the number of FTE.

Table 1. Overview of employed FTEs per staff type

Staff type (in FTE) / (N=response rate)	**Total FTEs**	**Average FTEs**
Directors (N=124)	109	0.93
Associate Directors (N=27)	23.5	0.87
Business Development Managers (N=114)	165.5	1.62
Legal Counsels (N=109)	324.7	3
IP Managers / Patent Attorneys (N=120)	133	1.19
Licensing Managers (N=107)	132.3	1.36
Finance Managers (N=93)	89	1.06
Administrative Staff (N=122)	208	1.89
Other Staff	288	3.24

(N=89)		

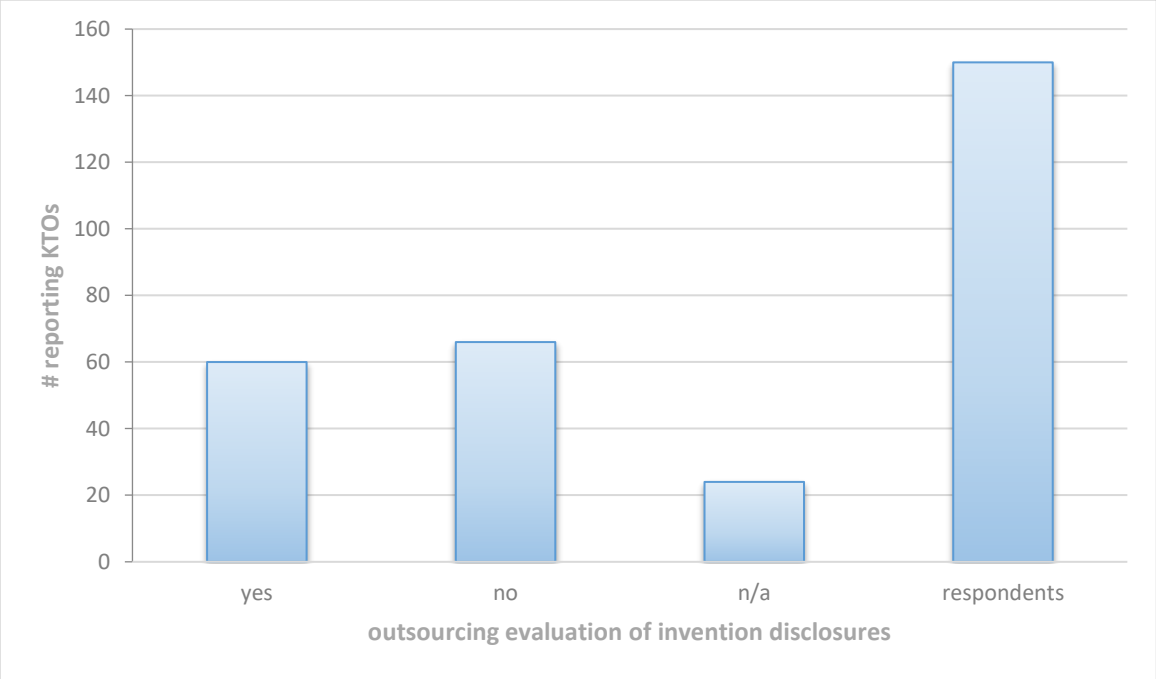
We observe that 214 responding European KTOs serve a total of 335 institutions, with the number of institutions served per KTO ranging from 1 to as high as 34, with 1.6 institutions served on average per KTO.

This represents an average, in 2014, of 1.246 FTE in R&D per KTO (n = 163).

The total operating budget for all responding European KTOs (n=141) in 2014 was 98,156,570 Euro, with an average budget per KTO equal to 696,145 Euro.

When looking at the activities carried out within the KTOs versus outsourced, the results are summarized in the following graphs. Here too a note of caution is needed: the number of responses to these questions is significantly lower due to the fact that no such data were available for UK institutions:

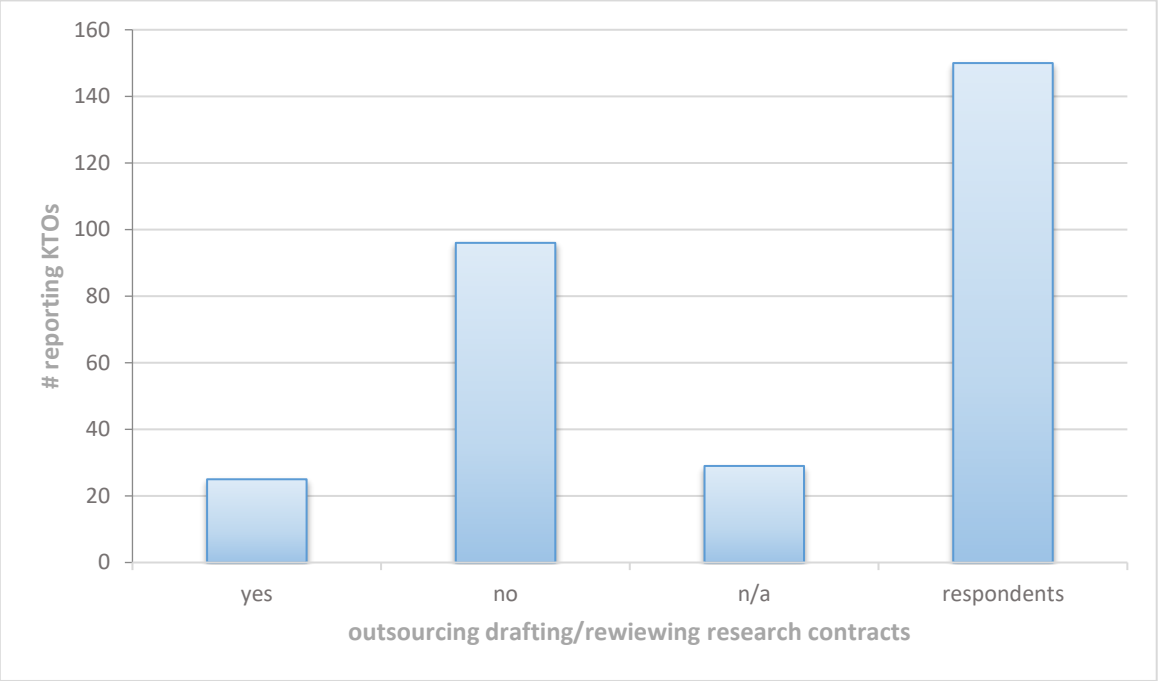
Figure 1. KTO outsourcing of the evaluation of invention disclosures[3]



While a significant part of the responding KTOs is outsourcing the evaluation of invention disclosure from time to time, the majority of KTOs is not outsourcing any evaluation aspect at all.

[3] We report as n/a where respondents did not provide data.

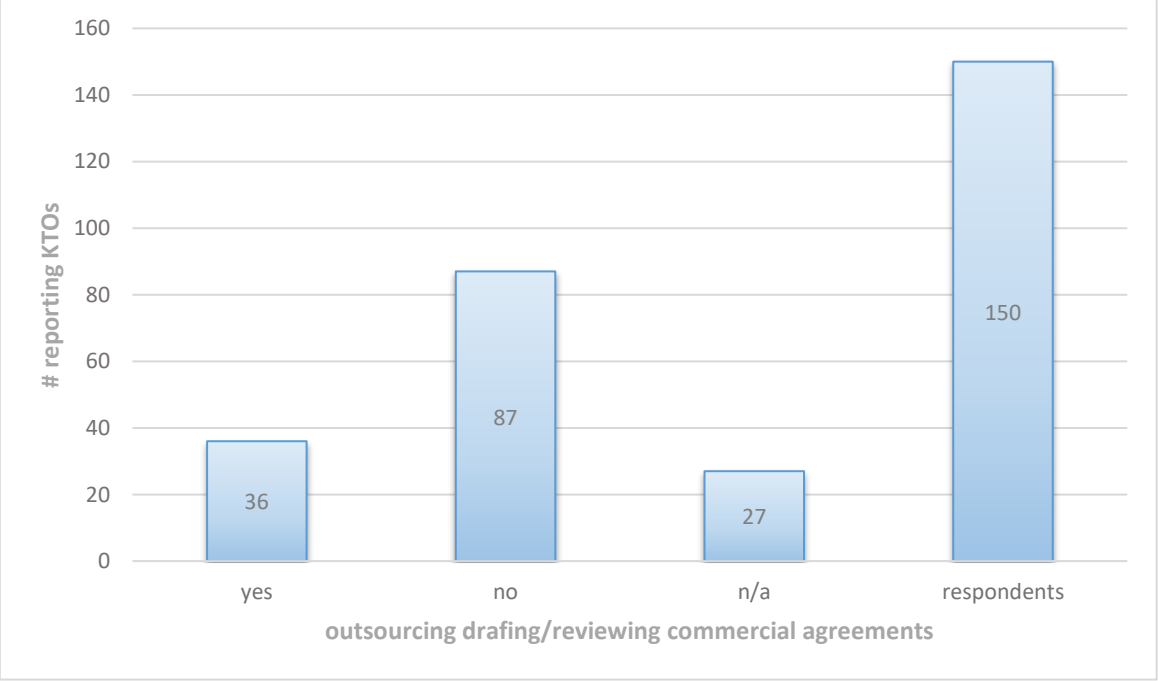
Figure 2. KTO outsourcing of drafting or reviewing research contracts



When looking at the legal work involved in drafting and reviewing research contracts (Figure 2), the large majority of KTOs never outsource such work while a small number of KTOs opt for (occasional) outsourcing.

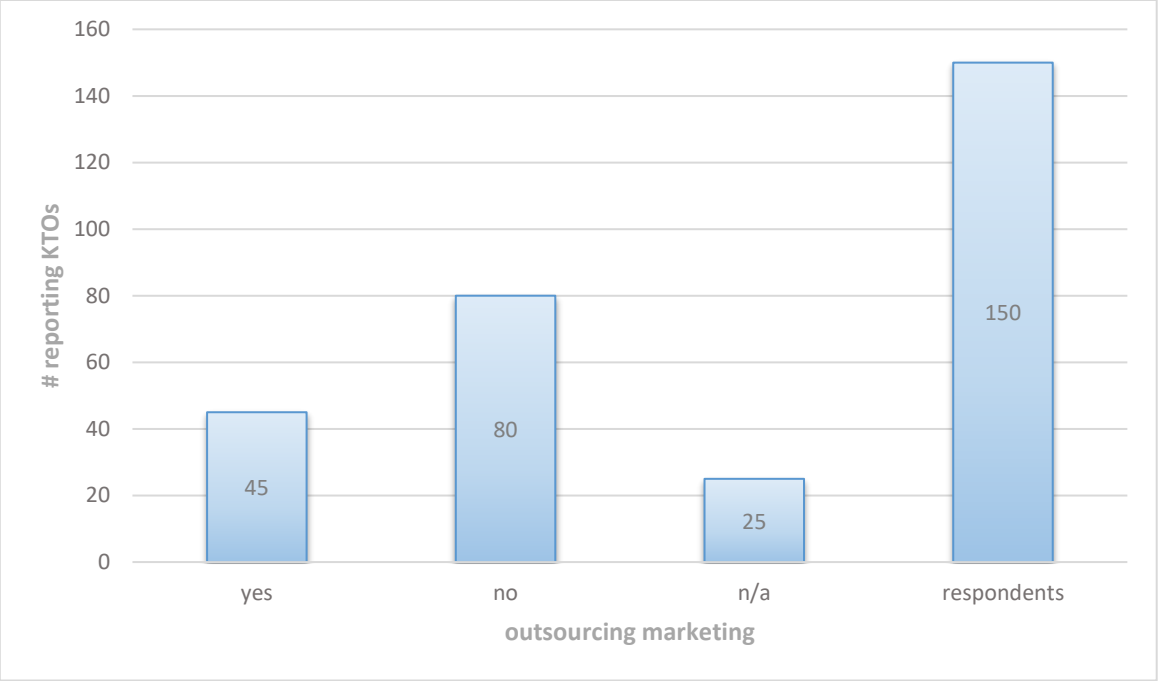
A similar distribution is seen when looking at the legal work involved in drafting and revising commercialization agreements, which is also largely an internal activity (see Figure 3).

Figure 3. KTO outsourcing of drafting or reviewing commercialization contracts



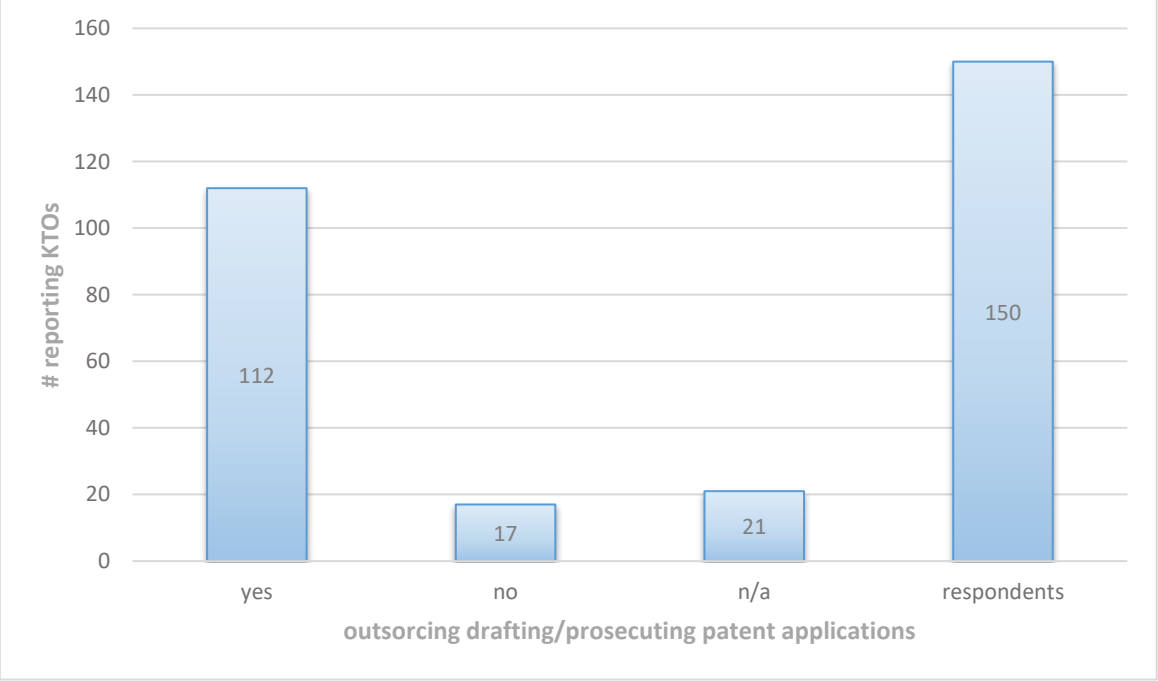
Communication and marketing activities are predominantly done internally by KTOs (Figure 4), although a significant fraction outsources such activity.

Figure 4. KTO outsourcing of marketing of licensing opportunities



Quite intuitively, drafting and prosecution of patents is done mostly resorting to external counsels (Figure 5).

Figure 5. KTO outsourcing of drafting and prosecuting patent applications



2) Intellectual Property

Intellectual property management represents a core activity for the commercialization of academic research results. Disclosures and patents on the one hand and academic spin-off creation on the other represent the main analyzed indicators of this section.

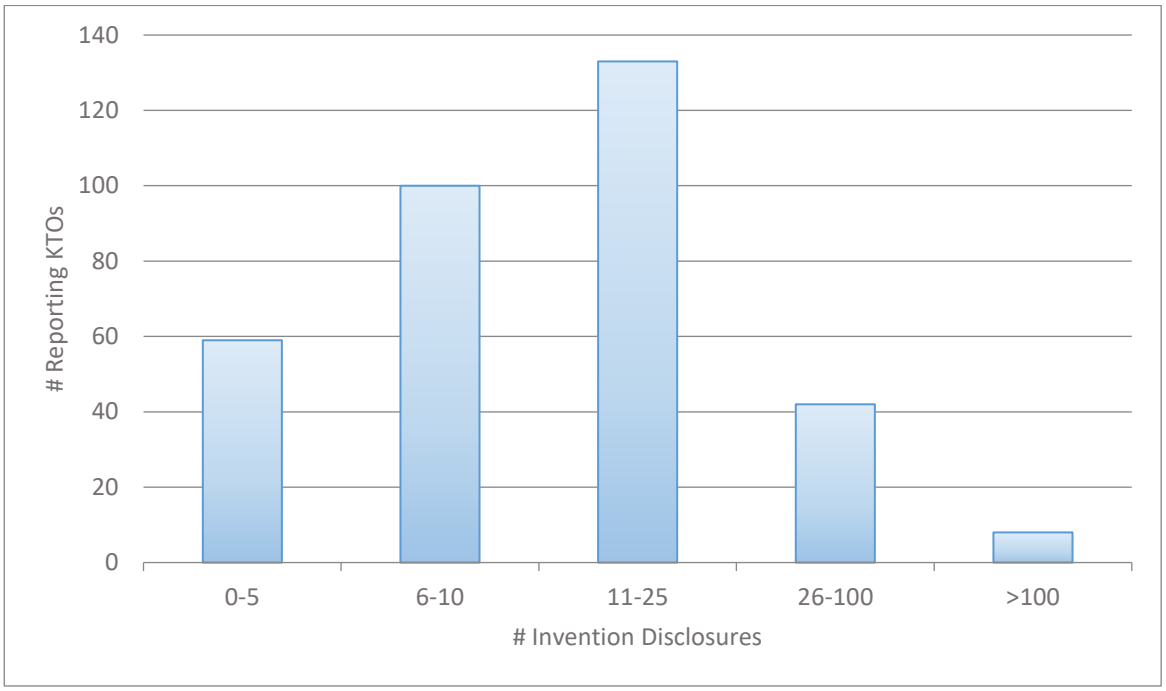
Table 2 shows the total and average number of invention disclosures, of priority patent applications and of granted patents in FY 2014. The number of valid responses varies greatly from one question to the other. For this reason we also report the average number of disclosures and patents per KTO, irrespective of the size of the Public Research Organization that is served by the KTO. We can observe from this table that European KTOs in 2014 - on average - received 20 invention disclosures each, filed 11 priority patents, and were granted 7 patents. We need however to alert that in some cases KTOs seem to have reported more than one patent grant per patent family (in contrast to what was requested in the survey) which may have resulted in overstating the actual ratio between patent applications and patent grants. There are also differences across the different patent regions in timescales between patent application and grant, thus the average figures shown may also reflect this disparity.

Table 2. Overview of invention disclosures, patent applications and patents granted

KTO activity / (N=response rate)	**Total**	**Average per KTO/PRO**
Number of invention disclosures (N=342)	6.605	19.3
Number of patent applications (N=184)	2,060	11.2
Number of patents granted (N=176)	1311	7.4

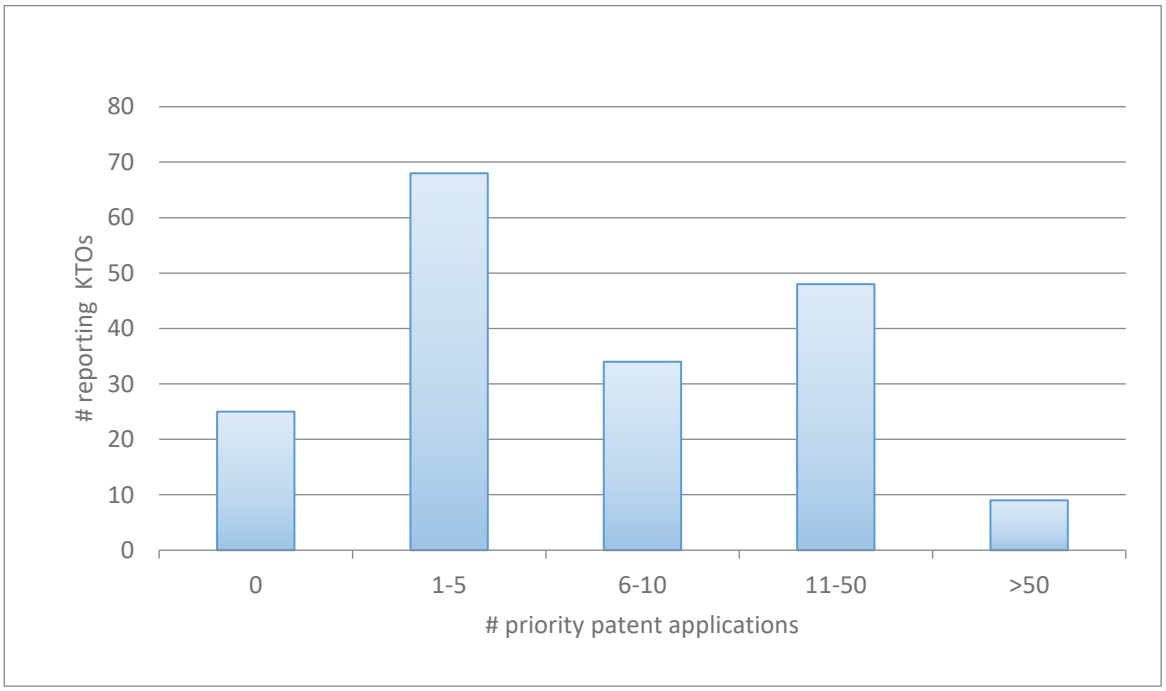
In order to explore the variation in the patterns of disclosure and patenting activities across KTOs, we illustrate the number of institutions referring to the number (in classes) of disclosures in the next couple of figures. Among those KTOs that reported between 0 and 5 invention disclosures, only 17 KTOs registered 0.42 KTOs declare between 1 and 5 disclosures. We can then see that the large majority of KTOs (233 KTOs corresponding to 68% of respondents) registered between 6 and 25 invention disclosures in FY 2014.

Figure 6. Number of invention disclosures per institutions



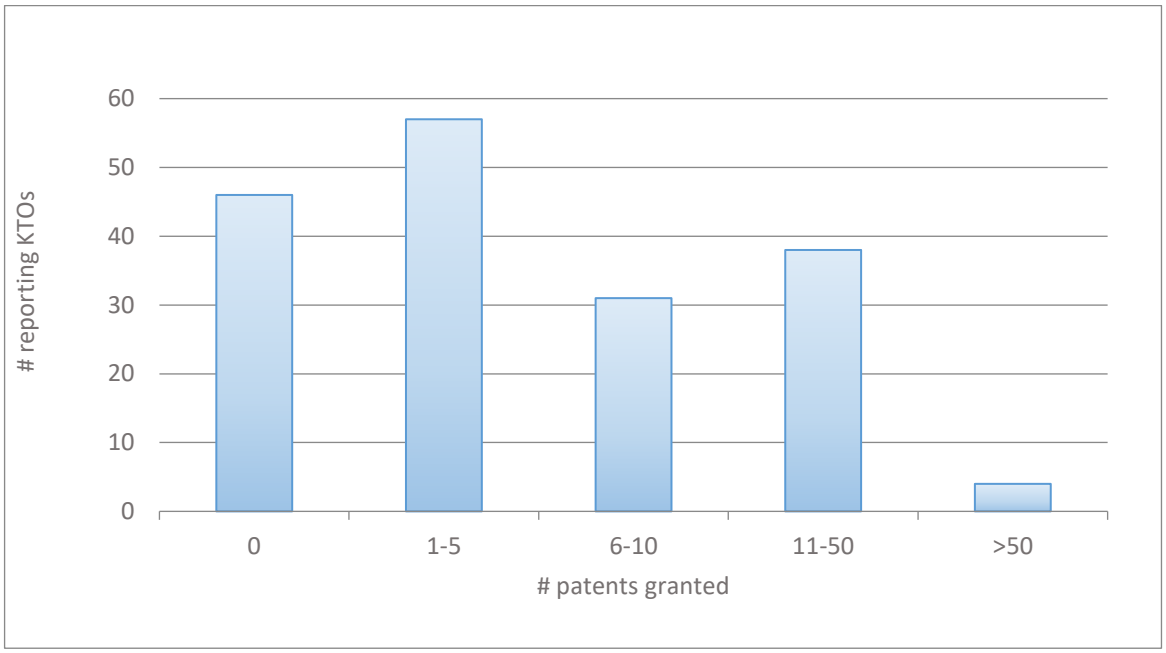
Concerning patent applications, on average about one third (31.19%) of the invention disclosures result in an actual filing of a priority patent application. While we note that there is a significant number of KTOs that report 0 patent applications (25, corresponding to 14% of respondents the largest share of respondents report in between 1 and 5 patent applications. Conversely only a small percentage of PROs reveal more than 50 patent applications. It´s worth noting however that some of the respondents are active in fields that don´t typically provide a good basis for patents (such as arts and music).

Figure 7. Number of priority patent applications per KTO



Concerning patents granted, we note that there is a rather high number of KTOs that report that none of their patents were granted (46, corresponding to 26% of respondents). As for patent applications the largest share of respondents report in between 1 and 5 patents granted. Again only a small percentage of PROs report more than 50 patents granted.

Figure 8. Number of granted patents per PRO/KTO



In the following section we focus our attention on patent families. Specifically, the number of patent families in the KTO's portfolio on the one hand and the percentage of these families that are subject to a license or option agreement on the other are described. Figure 9 illustrates that patent families distribute substantially similarly across the chosen classes. Out of a sample of 175 respondents KTOs, we can conclude that, although 31% of institutions hold in their portfolio between 0 and 10 patent families, about 36% hold more than 50 patent families, and almost 11% of respondents declare to have more than 200 patent families in their portfolio at the end of 2014.

Figure 9. Number of patent families in portfolio

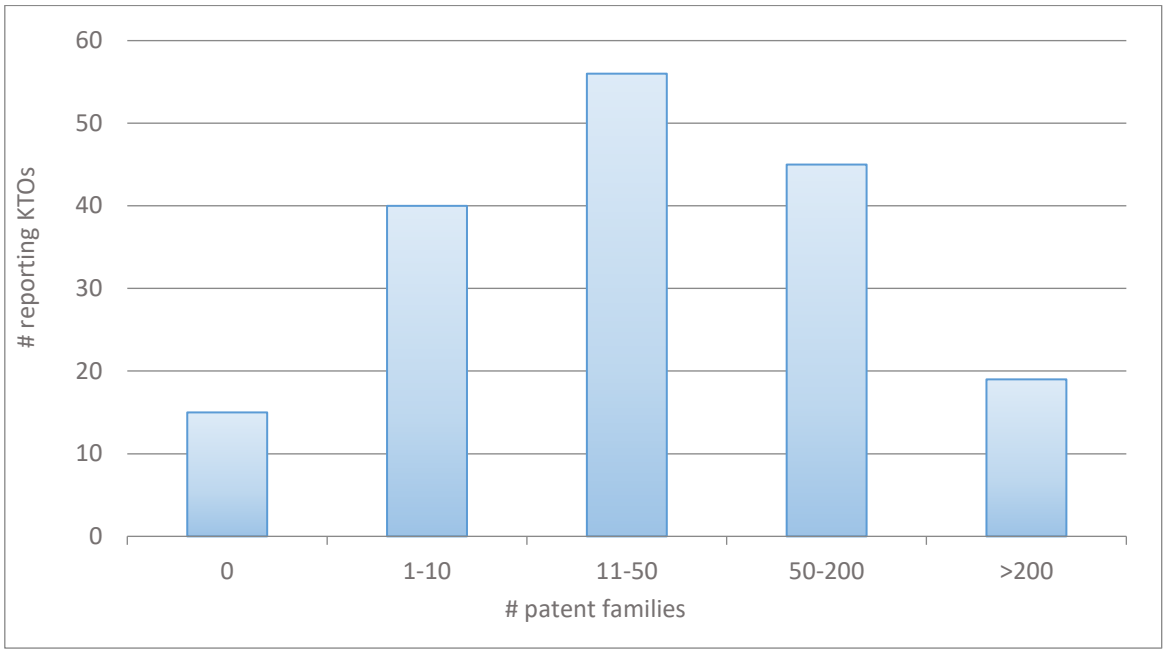
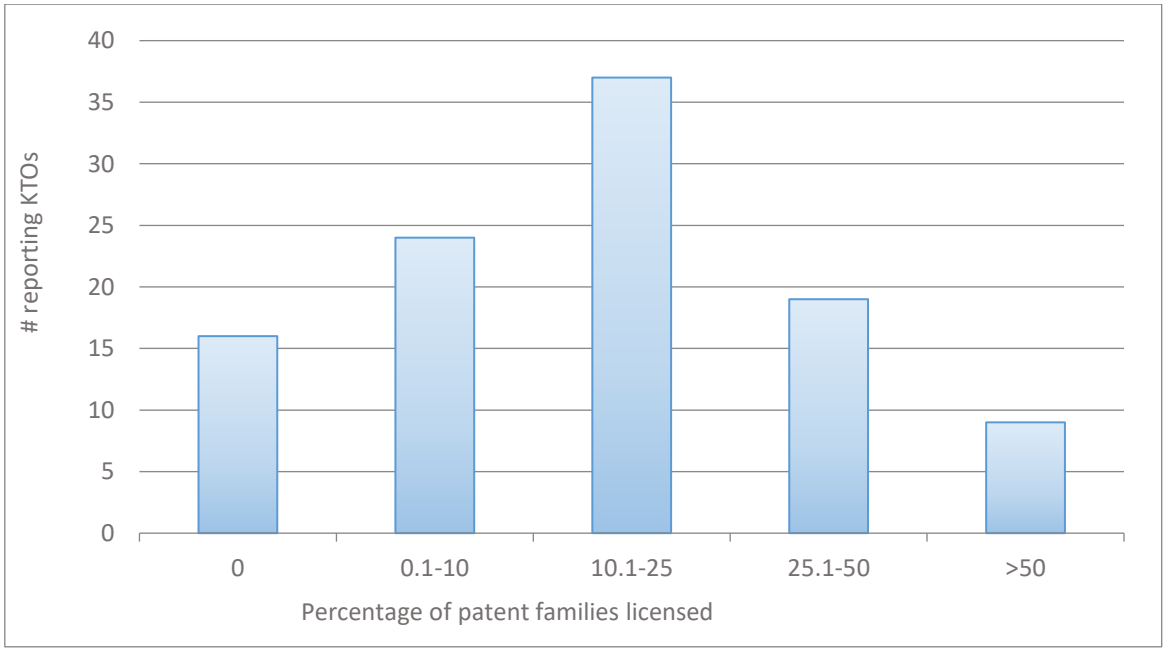


Figure 10 is based on a significantly smaller sample of only 105 respondents and shows the percentage of patent families per KTO licensed or optioned by the end of 2014. As it may be expected, a significant fraction of the responding KTOs has licensed or optioned only a small percentage of the patent families in their portfolio. More specifically, 44 KTOs (25% of respondents) have licensed between 0 and 10% of their portfolio. However, these numbers also indicate that 25% of reporting KTOs licensed more than 25% of their patent families.

Figure 10. Percentage of patent families in portfolio licensed or optioned



3) Contracts and License Income

This section will deal with different types of agreements concluded by European PROs/KTOs with respect to contract research, collaboration and consultancy based on their knowledge or patent estate.

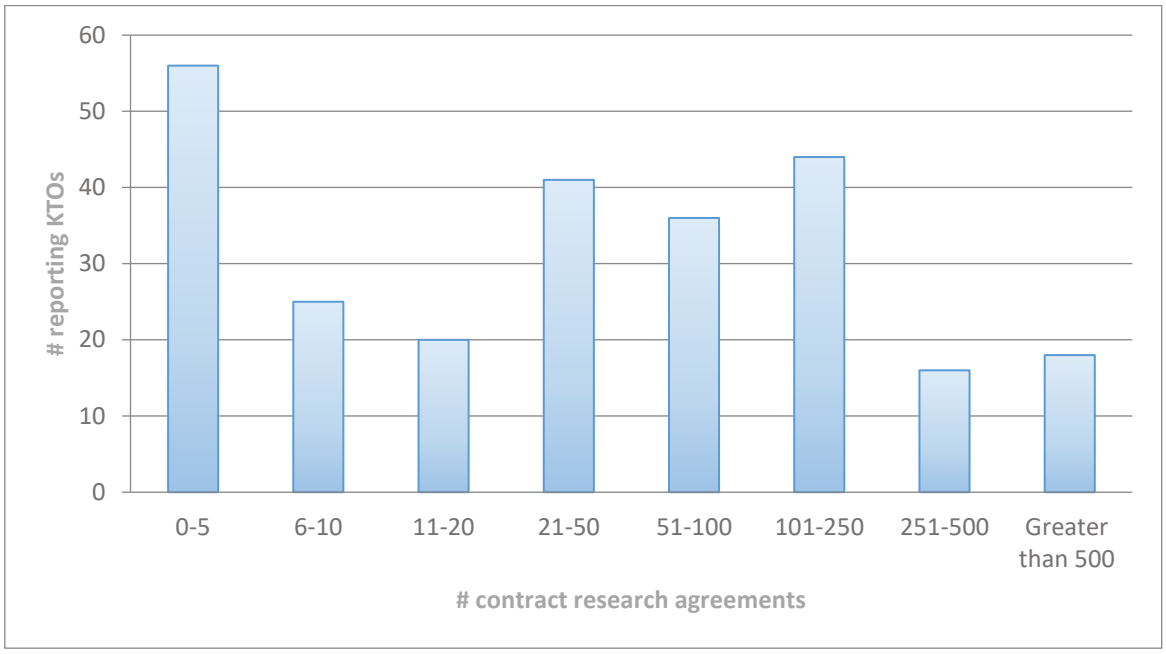
Table 3. Overview of commercialization agreements

Type of Agreement	Total	Average per KTO/PRO
Contract Research Agreements (N=256)	31,982	124.9
Collaboration Agreements (N=105)	4,211	40.1
Consultancy Agreements (N=248)	109,286	440.7
Option Agreements (N=109)	110	1.0
License Agreements (N=281)	9,442	33.6
Assignment Agreements (N=105)	173	1.6
MTAs (N=100)	424	4.2
Software Agreements (N=152)	4,999	32.9

As stated above, not all of the responding PROs provided numbers for each of the questions asked and thus the number of respondents varies for each category. Regarding contract research activities, it is worth mentioning that the total reported income from that activity was more than 1.7 billion Euro with another 1.5 billion Euro reported collective income from collaborations. The aggregate income from consultancy agreements was still more than 600 million Euro.

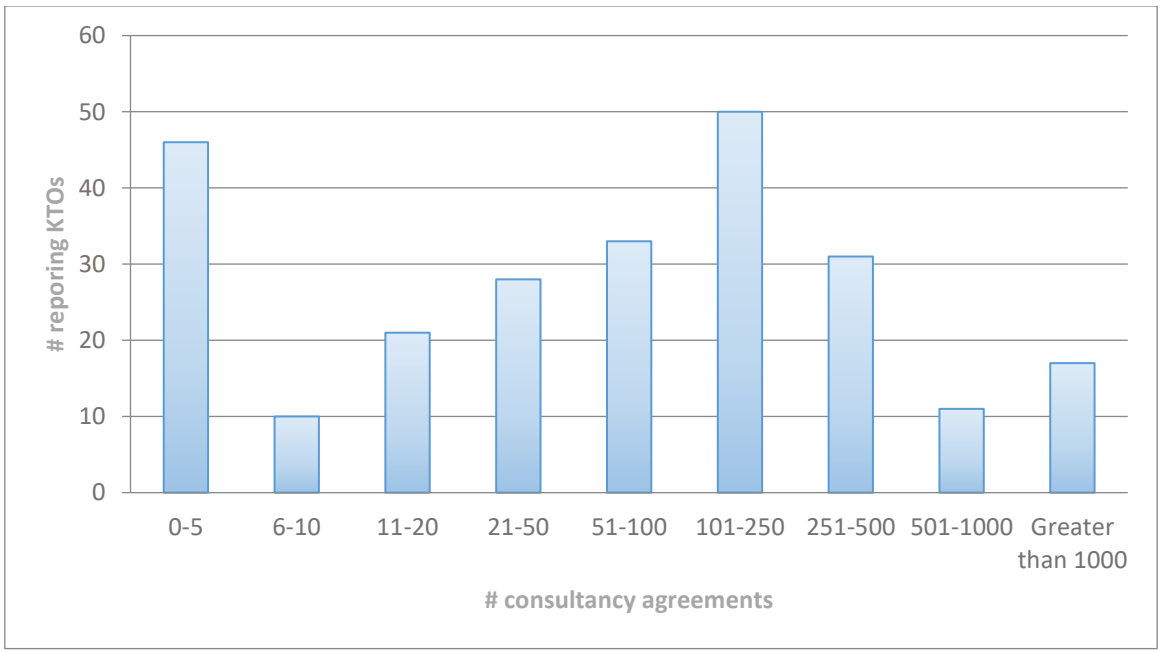
While almost one third of the responding PROs (81 respondents) reported only up to 10 new contract research agreements, as much as 7% (or 18 institutions) report more than 500 contracts in the given year.

Figure 11. Number of new contract research agreements



For consultancy agreements a similar distribution pattern can be seen in the following graph:

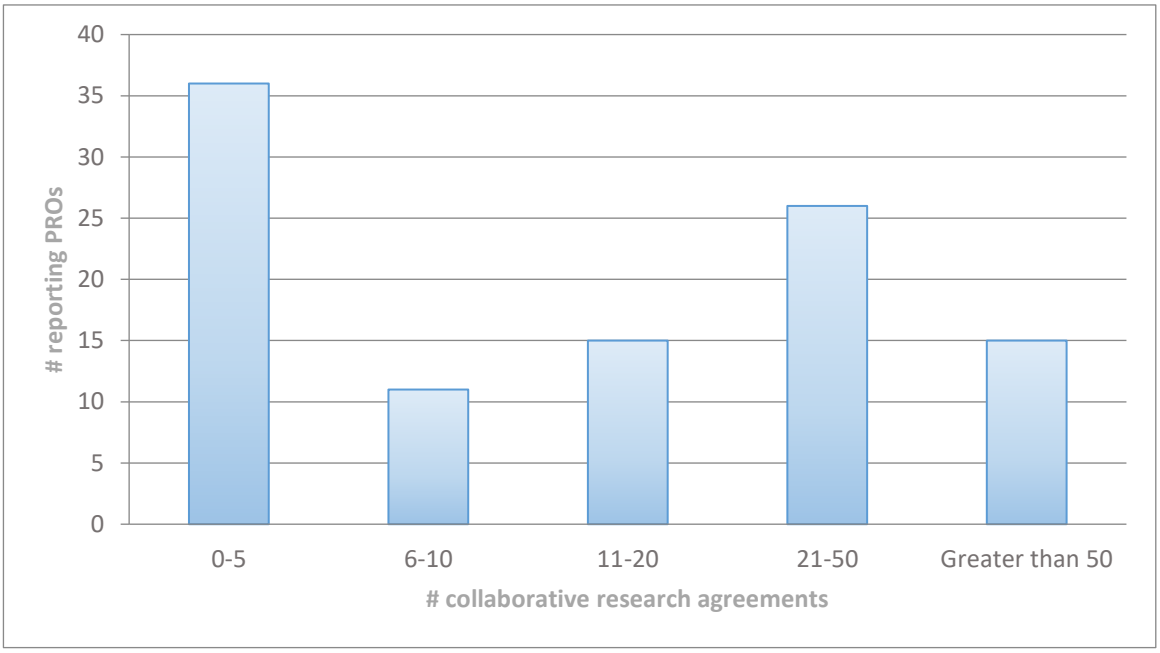
Figure 12. Number of new consultancy agreements



Again a significant part of the respondents (22,6%) report having concluded not more than 10 agreements in the FY 2014 period but compared to contract research agreements there is a larger number of PROs/KTOs (109) that have concluded more than 100 consultancy agreements. Interestingly 11% of all respondents (28 PROs/KTOs) seem to be very active in that field, reporting more than 500 or even more than 1.000 consultancy agreements in 2014.

Compared to contract research agreements the respondents report significantly lower total numbers with regard to collaborative research agreements. The distribution is relatively homogeneous with the majority of the respondents reporting between 0 and 20 agreements and a rather small fraction (15 respondents) reporting more than 50 agreements for FY 2014.

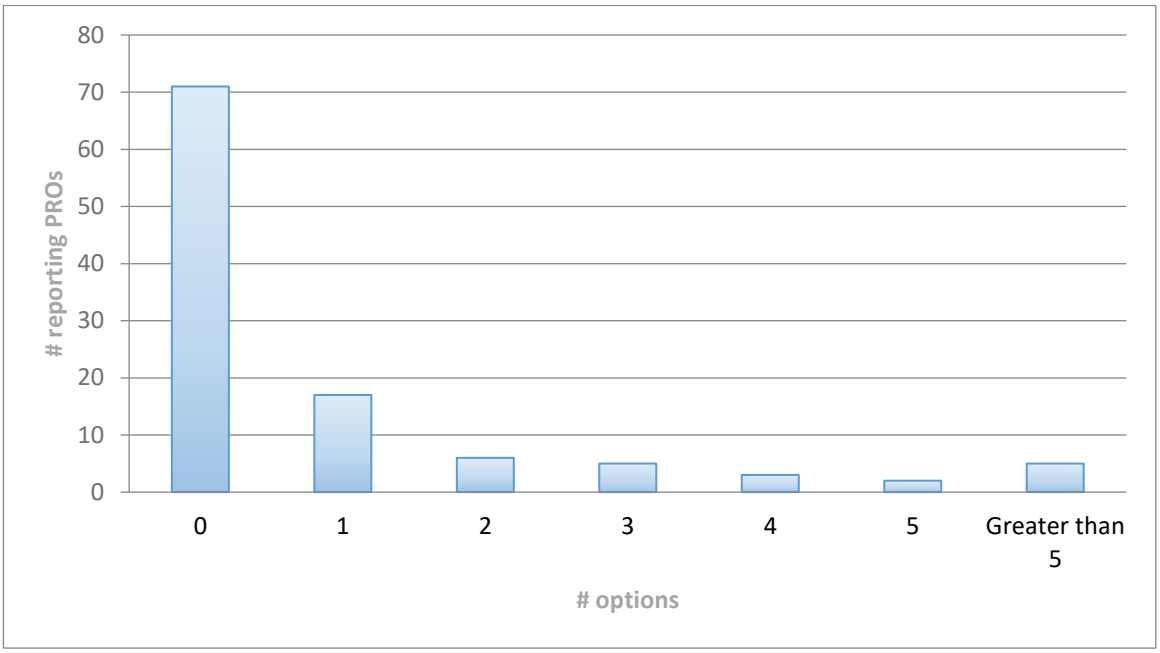
Figure 13. Number of new collaborative research agreements



The following section will provide some insight into how the PROs/KTOs participating in the survey have commercialized their intellectual property estate as described in more detail in the intellectual property section of this report. The following commercialization routes will be detailed in the following analysis: option agreements, license agreements, assignment agreements and software agreements.

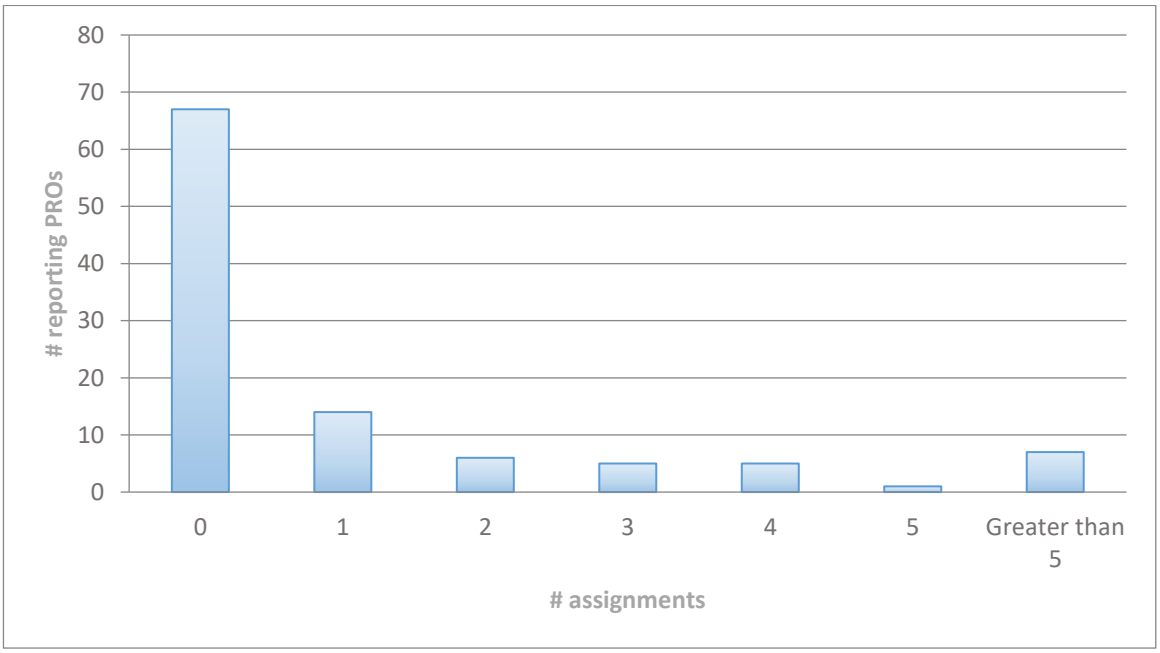
It can be deduced from the following graph that, with an aggregate reported number of 109, option agreements are a less used instrument for commercialization. The large majority of responding PROs reported fewer than 5 option agreements for FY 2014.

Figure 14. Number of new option agreements



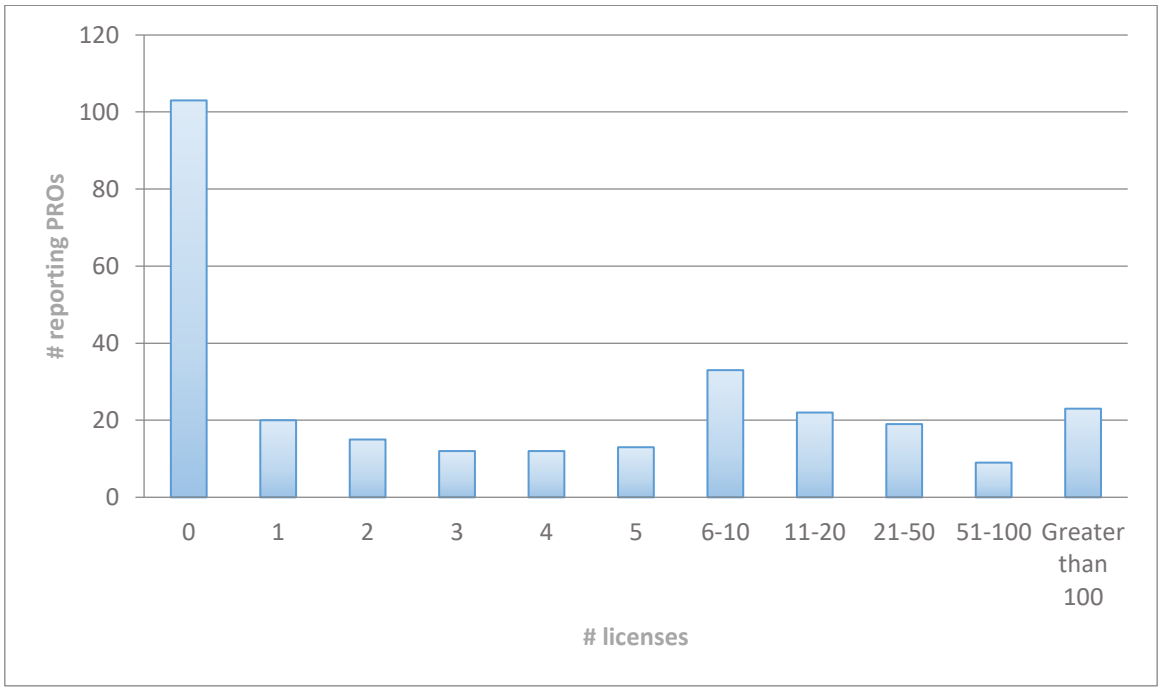
The same is true for assignment agreements. With a total number of 173 reported assignments in FY 2014, this commercialization route was only used marginally more often than option agreements and far less often than license agreements. Only a very small fraction (6.6%) of the respondents (7 respondents) seems to use assignments more frequently, with more than 5 assignments in the reporting period.

Figure 15. Number of new assignment agreements



As expected, the most dominant route of commercialization is licensing with 9.442 license agreements concluded in the reporting period. The following graph shows that a fairly high number of respondents (103 respondents or 36.65%) have reported that they have not concluded any license in FY 2014, the vast majority of the responding PROs or KTOs (175 respondents or 62.28%) have concluded up to 5 license agreements but some organizations (23 respondents or 8.19%) have even been able to conclude a quite substantial number (>100) of license agreements (incl. software license agreements) in the reporting period. A rather small number of PROs or KTOs have even reported that they have concluded more than 250 license agreements.
Especially the larger numbers may however be due to the fact that there was no limitation imposed for UK respondents regarding counting several license agreements based on one and the same patent family. Due to such lack of limitation, numbers for UK participants tend to be structurally higher than for participants of other EU states.

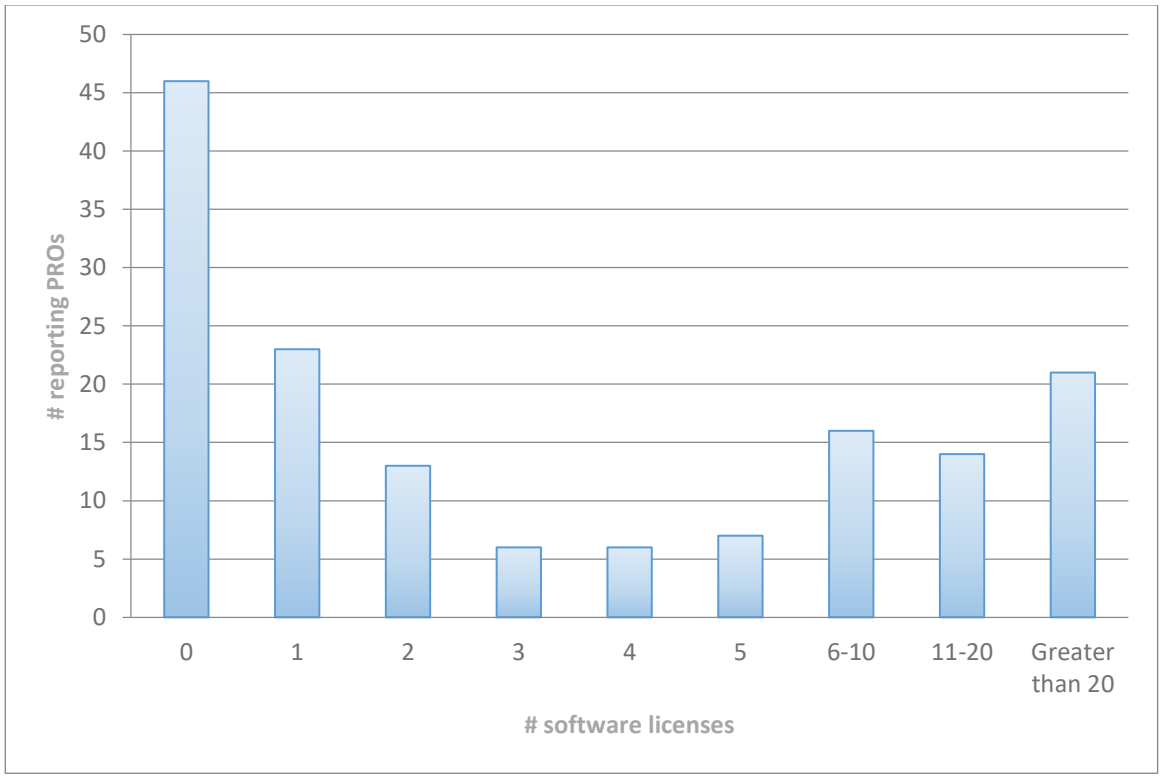
Figure 16. Number of new license agreements



Given the special role of software in IP asset commercialization, the Survey also addressed transactions concluded in that specific domain.

The responding PROs/KTOs reported in total 4,999 software agreements in FY 2014.

Figure 17. Number of new software license agreements



Again, as in the case of option, assignment and license agreements in general a relatively large number of PROs/KTOs (46 respondents or 30.3%) reported that they have not concluded any software license in FY 2014. The majority of the responding PROs or KTOs (101 respondents or 66.4%) reported up to 5 licenses a year with only 13.9% reporting more than 20 software licenses a year.

4) Spin-offs and Start-ups

This section deals with the establishment of spin-offs and start-ups each as defined in the Survey Questionnaire (see Appendix).

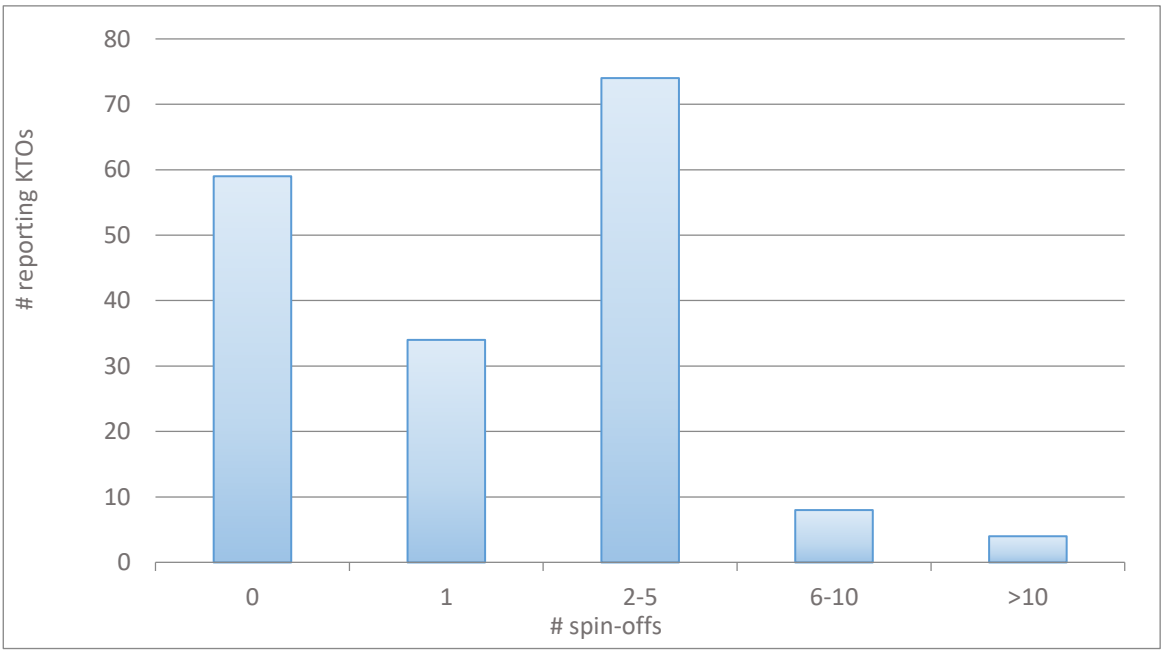
Table 4. Overview of spin-offs and start-ups

Entrepreneurship activity	Total	Average per KTO/PRO
Spin-offs (N=179)	355	1.98
Start-ups (N=96)	331	3.45

While the response rate was higher regarding spin-offs than start-ups the average number of start-ups created per responding KTO/PRO was higher than for spin-offs. Due to the rather large number of KTOs/ PROs reporting no spin-off/start-up activity average numbers are relatively low. Regarding the KTOs/PROs with activity in that field (i.e. reporting one or more spin-offs/start-ups) the average numbers are significantly higher with 2.96 spin-offs and 9.19 start-ups per active KTO/PRO.

Figure 18 shows that about half of the 179 respondents declare the creation of either 0 or 1 academic spin-off in 2014. In more detail, 59 KTOs registered no academic spin-off formed in this fiscal year, while 34 KTOs reported only 1 spin-off created. Furthermore, 74 KTOs reported having spun-off 2 to 5 companies, while only 12 reporting KTOs created more than 6 spin-offs in fiscal year 2014.

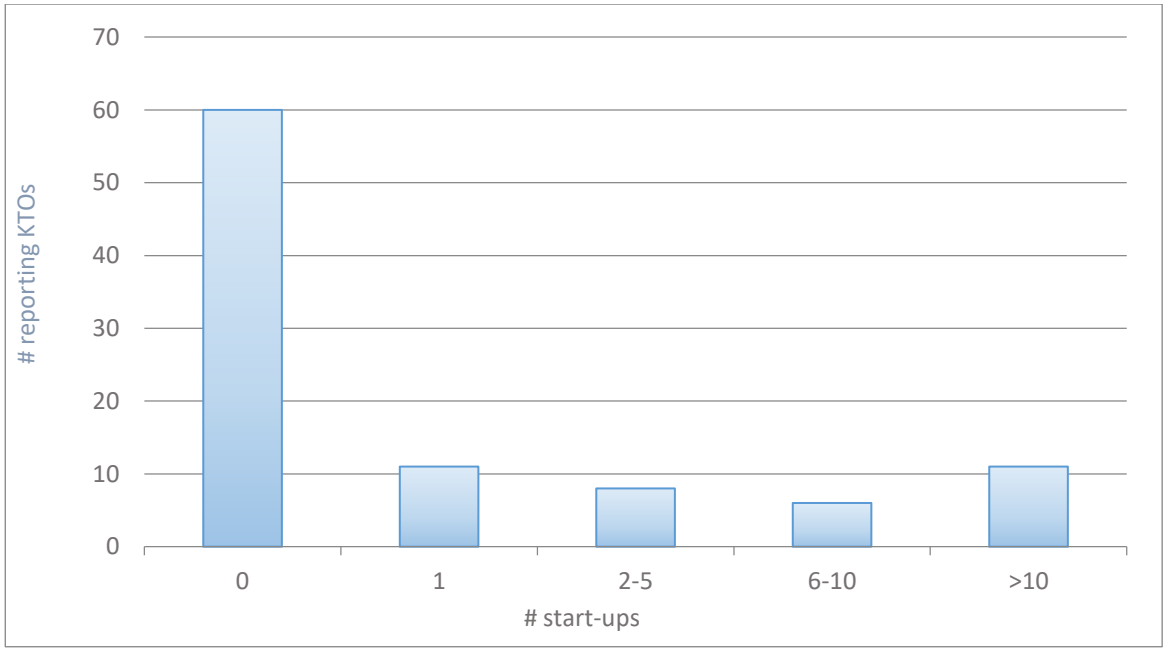
Figure 18. Number of academic spin-off generated



Regarding the analysis of the formation of start-ups it is important to note that only very few KTOs provided suitable answers. Interestingly, however, out of 96 respondents the large majority (60 KTOs) stated that they did not create any start-up. On the other hand 11 KTOs/PROs record more than 10 start-ups in FY 2014 which is significantly more than the 4 KTOs/PROs reporting more than 10 spin-offs in FY 2014.
This may be explained in that most KTOs – because start-ups by definition do not require licenses to IP held by the PRO/KTO – tend to be less involved in supporting the creation of start-ups while a smaller group of KTOs/PROs seems to engage significantly in supporting the creation of start-ups.

Figure 19 shows the distribution of respondent PROs in respect to the number of constituted start-ups. We have to alert however that definitions for start-ups may vary from country to country which might have an impact on the reported numbers.

Figure 19. Number of start-ups generated



Finally, we report on the total amount of private investment raised by spin-off and start-ups.

Although with only 64 respondents, it is worth noting that 14 PROs state an amount of over 1 million Euro raised by their spin-offs, with 6 PROs reporting total investments of over 10 million in FY 2014 in their spin-offs, with the two highest values of 100 million and 500 million Euro being quite impressive.

V. Conclusions

This survey is a landmark for ASTP-Proton activities after the merger of the two associations. It represents a consistent endeavor in surveying knowledge and technology transfer in Europe, gathering and analyzing data from over 300 KTOs that can be used by interested stakeholders such as policy makers, PRO management and boards, innovation researchers and knowledge and technology transfer professionals.

The data gathered indicate a great diversity in knowledge and technology transfer in Europe. This should not come as a surprise. While in some countries KTOs have been active for a long time, for other countries organized knowledge and technology transfer activity is quite new. Moreover, PRO-industry relationships also differ from country to country. Therefore, the task of presenting unified data summarizing the European landscape is challenging. One reason for this is that, by presenting aggregate data, the contexts of individual data points are lost. Without such context, there is a risk for such data to be misunderstood or misused. Another reason relates to the fact that a number of different data sources were used in this survey, as previously explained in Section III. Many KTOs only track the data that goes into national surveys. Therefore, the dataset for this survey is, in some sense, incomplete and not always homogeneous. The decision of ASTP-Proton was nevertheless to publish the data (where such data was thought to be consistent with the core ASTP-Proton survey data) because the KT profession and policy makers should have an initial source of information on KTOs and their activities and output.

The first part of the survey was meant to characterize KTOs. While in many countries KTOs typically serve only one PRO, in some regions more centralized structures (e.g. KTOs (so called “PVAs”) in Germany) prevail, with one KTO reaching out to multiple PROs which in terms of figures results on average in more than one PROs served per KTO. Main drivers for centralized approaches are building on a critical mass of capacity and IP portfolio under management as well as efficient resource sharing with their partner PROs. It is possible that some of the human resources reported as part-time positions in KTOs are being shared with, or among, institutions, where they perform other non-KTO related tasks (e.g., legal counsels may be providing legal counseling to the organization in other areas, such as public procurement).

KTOs are also frequently using outsourced services – eventually covering areas where there is no resident expertise, or just to compensate work peaks. According to our survey data drafting and prosecuting patent applications was the most prominent form of outsourcing used by KTOs in FY 2014. While many KTOs report having IP managers/patent attorneys, it seems they are not enough for the amount of activity in this area. A likely explanation for this may be related to the area specialization of the patent attorney himself – again, the issue of expertise comes into play. Human resource management remains, therefore, a central issue for KTOs in Europe.

Intellectual property management is a central activity for KTOs in general. 0n average, a European KTO received 20 invention disclosures, filed 11 priority patents and was granted 7 patents. When looking with greater detail, a few KTOs did not file any patent application. This may sound intriguing, but there can be several reasons for this. If for example the KTO was particularly stringent on commercial potential and/or patent analysis. Such stringent selection of projects to take forward may be induced by a lack of resources, either to cover patent costs or for effective handling. Other possible reasons for low or no patent filing: (i) the PRO has a strong focus on

contract research (where the partner acquires ownership and responsibility for patent filing); (ii) the PRO has a significant research focus and strength in fields not reliant on patents such as humanities or social sciences; (iii) there is a lack of IP awareness within the PRO that often causes academic publications to destroy patent novelty; or (iv) alternative forms of intellectual property protection(such as copyright) are available that can also underpin commercial application of a particular invention. Lastly, patent protection is a costly business and as costs rise with the increase in a KTO's patent portfolio, it may be difficult for KTOs to invest in novel patent applications.

Still in the IP management section, several KTOs report that there were no patents granted in FY 2014. As patents may take more than five years to be granted (via the PCT route), this should come as no surprise. Newer KTOs just may not have patent applications in their portfolio yet that have reached this stage. For others, it may be a result of a year that was not so abundant in patent applications or the KTO was not even filing patent applications in the first place. Another strategy that seems to be quite common among KTOs is to file patents quite frequently, but abandon them by the end of the priority year or PCT procedure if no commercial partner has been identified. This may allow the TTO to invest their patent budget on protecting more inventions, while being very stringent in selecting those that will be continued in the national phase. Such a strategy is expected to lead to a sizable patent portfolio but with few applications going all the way to grant.

The difference between the number of reported new patent applications and the total number of patent families managed by the KTOs indicates an active, multi-year management of such patent portfolio. Moreover, the number of patents licensed or optioned not only supports the active commercialization efforts of a KTO but will also impact upon the size of a portfolio requiring an active role of KTOs during the application process and maintenance of the patent(s) with the ultimate partner(s).

This brings us to contracts and licensing income. A significant number of KTOs reported performing Contract Research Agreements, Consulting Agreements, and License Agreements. While less relevant for some PROs, the largest source of income appears to come from Consultancy, both in terms of aggregate figure and average by KTO/PRO. As reported in figure 12 11% of KTOs seem very active in this field. Option agreements appear to be much less used as commercialization instruments, as well as assignments. As opposed to concluding option and assignment agreements, straight licensing seems to be by far the most common commercialization strategy for KTOs/PROs. From an overall perspective, this section shows that different KTOs prefer different routes towards knowledge and technology transfer. Some appear to be quite active selling the PROs researchers know-how through consultancy, while others are more active in the contract research/licensing area.

Finally, another possible route for IP exploitation is through the establishment of spin-offs. The reported figures are showing that several KTOs did not report any spin-off activity during FY 2014. Despite spin-offs being an important vehicle for IP exploitation, there can be many reasons for lack of new company creation around PROs IP, including the fact that early stage and high risk areas (yet highly innovative and financially rewarding R&D areas) like life sciences require both significant initial investment and also long term gestation, thus proving difficult to attract initial investors; the potential conflicting goals of the academic inventors or respective governance of the

PRO may make it difficult for them to combine their academic endeavors with providing the necessary initial scientific input and support to a spin-off; the local environment may yield insufficient entrepreneurs to pick up the company activity.

In conclusion, the ASTP-Proton FY 2014 survey sheds light on quantifiable knowledge and technology transfer activities in Europe and this report presents a diverse landscape. Despite some limitations mentioned in the report our FY 2014 data lays the foundation for a more robust survey and potential time series comparisons in the years ahead, providing a more complete and accurate portrait of knowledge and technology transfer in Europe - subject however to the continuous contribution and support of European KTOs and national associations to our future surveys.

While the numbers presented in this report may give a feel for knowledge and technology transfer activity across Europe, we are well aware that such numbers only paint part of the picture. Many aspects of knowledge and technology transfer are not captured by such numbers and this report should therefore not be used as a (sole) means to determine the quality of any particular KTO. While knowledge and technology transfer is (or should be) not only driven by economic aspects but also about helping achieve 'societal impact' of academic knowledge (be this economic impact or not), such a goal is not captured by numbers alone.

VI. Acknowledgements

The ASTP-Proton Board and the Survey Committee would like to thank the survey respondents for collecting relevant data of their university or research organization and answering a rather extensive questionnaire. This data is the prerequisite and basis for this report which provides very useful data to the profession of knowledge and technology transfer. We also thank the National Associations and the ASTP-Proton National Associations Advisory Committee (NAAC) for their tremendous support in supporting our collection of an extensive European TTO data set. In this regard we would like to extend our special thanks to Adrian Day and Darren Watson of HEFCE as well as to David Bembo of AURIL, who brokered the contact there. Our thanks also go out to the NETVAL, RedOTRI, Universities Denmark, Technologie Allianz and IKTIG associations for their substantial and invaluable support.

We are very thankful for the commitment and very hard work by the Survey Committee which was necessary to collect, clean up and analyze the data and the generation of a compelling report for our stakeholders. The process of developing the report is a quite laborious and tedious effort conducted by highly committed volunteers. We are grateful for the engagement and support of the Survey Committee that together with the assistance of the headquarter team allows us to provide our members and contributors with what we hope is a real value add for their business.

We also would like to thank our cooperation partners from Instituto de Engenharia de Sistema e Computadores, Tecnologia e Ciência (INESC TEC) in Porto, Portugal for their strong support in the statistical analysis and advise on the report. They have been instrumental in drawing statistically relevant conclusions from the data we collected with the support of the respondents from all over Europe.

The cooperation with national organizations is of tremendous value as they contribute significantly to the completeness of our territorial coverage and thereby increase the representativeness of our findings. We intend to increase the breadth and intensity of such cooperation to be able to provide additional valuable information such as regional differences and trends in the future and invite national organizations to support our efforts.

Ulrich Mahr
VP Survey and Impact

VII. Survey Committee

Ulrich Mahr, MBA, RTTP
(Chairman, VP Survey and Impact)

Koen Verhoef, PhD, RTTP
(Vice Chairman)

Peter O´Fegan, M.Sc.

Massimiliano Granieri, PhD

Laura Ramaciotti, PhD

Ugo Rizzo, PhD

Appendix A: FY 2014 Survey Questionnaire

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Welcome to the ASTP-Proton Knowledge Transfer Survey

REFERENCE YEAR

Please provide us with data relevant for the 12 month period that is used within your Knowledge Transfer Office or Public Research Organization for financial reporting ("Financial Year" or "FY").

If this period does not coincide with a calendar year (e.g.: your Financial Year starts on May 1st), then please provide us with data for the 12 month period that ENDS in the year for which data are requested. In the example above: Financial Year 2014 (FY2014) would be the period from May 1, 2013 – April 30, 2014.

This survey collects data for **FY2014**

If your KTO is the major service provider for more than one Public Research Organization, please provide aggregate data for all PROs combined where possible.

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Demographics and publication consent

*** 1. Please provide demographic information on your Knowledge Transfer Organization (KTO) or - if the KTO is not a separate legal entity - your Public Research Organization (PRO).**

Name of contact person for the survey

Name of KTO or - if not independent - the Public Research Organization of which the KTO is a part:

Address 1:

Address 2:

City/Town:

State/Province:

ZIP/Postal Code:

Country:

Email Address contact person:

Phone Number contact person:

2. Please tick the box below if you are happy for us to publish the data submitted by you under this survey without anonymization.

◯ Yes, I have no objection for the data provided hereunder to be published in a non-anonymized way

If you haven't ticked the box above, we will assume you do not give permission to publish the data in a non-anonymized way. Your data will then only be presented in aggregate fashion and will not be traceable to your organization

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KTO clients and age

3. Please give the total number of Public Research Organizations (PROs) for which your Knowledge Transfer Office (KTO) is THE major provider of Knowledge Transfer Services:

4. The number of PROs that are served by your KTO in FY2014 by type

General University	
Technical University (if separate from general university)	
Hospital	
Not-for-profit Research Institute	
Research Park or Incubator	
Other	

5. In what year was your KTO established?

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KTO Personnel

6. What was the total number of KTO staff in full-time equivalents (FTEs) at the end of FY2014:

For Question 7 below, the following definitions are used:

- DIRECTOR: head of the Knowledge Transfer Office, carries overall responsibility for Knowledge Transfer activities within the organisation, incl. budget and personnel.
- ASSOCIATE DIRECTOR: responsible for part(s) of KT operations, has partial signing authority, reports directly to the Director, typically supervises other KT staff within his/her remit.
- BUSINESS DEVELOPMENT MANAGER: focuses on developing stronger ties with industry, investors and government. Possibly acts as an account manager for large industry and other stakeholders.
- LEGAL COUNSEL: provides legal advice on contractual arrangements and is responsible for drafting research and commercial agreements, Reports to an Associate Director or in smaller offices directly to the Director.
- INTELLECTUAL PROPERTY MANAGER: manages the patent portfolio, is potentially also responsible for negotiation of IP terms in research agreements. Supports the Associate Director or the Licensing Manager on IP-related aspects of commercial opportunities; communicates with patent firms on drafting and prosecution of patent applications.
- LICENSING MANAGER: responsible for case management, evaluation of opportunities, market research, marketing and licensing of technologies. Reports to an Associate Director or in smaller offices directly to the Director.
- FINANCE MANAGER: responsible for financial functions in the office, including invoicing of license revenues, payment of service provider costs and keeping track of budgets; Reports to an Associate Director or to the Director.
- ADMINISTRATIVE SUPPORT STAFF / PARALEGAL: supports the knowledge transfer activities within the office such as secretarial work, database and file management, office management, processing of (financial) paperwork; has no supervisory tasks. Reports to any of the above positions.

7. Within the total number provided in question 6 for FY2014, please provide a number for each of the following categories (expressed in FTEs). Use fractions if needed.

Director	
Associate Director	
Business Development Manager	
Legal Counsel	
Intellectual Property Manager/Patent attorney	
Licensing Manager	
Finance Manager	
Administrative support staff/Paralegal	
Other salaried staff	

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Expenditures and funding sources for the KTO

8. Please give the total gross expenditures of the KTO in FY2014

9. What percentage of the KTO's expenditures is covered by the following financial sources:

	%
PRO's direct funds (including personnel and ordinary expenses)	
Self-financing from research agreements (revenues from research and consultancy contracts, collaborative research, technical services)	
Self-financing from commercial revenues (revenues from licensing activities, patent assignments, liquidation of equity etc.)	
Government grants (only include if specific for KTO activities)	
Reimbursement of KTO expenses by licensees	
Other (please specify below)	

10. If a percentage of the KTO expenditures is covered by "Other" sources, please specify these sources here:

11. Does your KTO sometimes outsource one or more of the following tasks?

	Yes/No
Evaluating the commercial potential of invention disclosures	Yes
Drafting and prosecuting patent applications or applications/registrations for other Intellectual Property Rights	No
Drafting or reviewing Research Contracts (e.g. MTAs, Collaborative Research Agreements, Contract Research Agreements etc.)	No
Drafting or reviewing Commercialisation Agreements (e.g. Options, licenses, assignment/revenue share agreements etc.)	No
Marketing or advertising your Licensing Opportunities	No

12. Who would normally own the patent rights to a technical invention created within the PRO(s) that your KTO provides services for (either by law or through internal regulations)? **Please choose only one.**

- ○ The Institution
- ○ The Inventor

13. Please indicate what activities your KTO is engaged in (as THE major player in such activity within your PRO(s)):

- [ ] Assistance/advice in writing research grant applications
- [ ] (Research) Project management (e.g. coordination of EU projects)
- [ ] Negotiating Research-related Contracts (collaboration agreement, MTAs etc)
- [ ] Evaluation of Invention Disclosures
- [ ] Management of IP portfolio including patent applications
- [ ] Marketing of knowledge and technology offers for commercialisation
- [ ] Licensing of IP rights and knowhow
- [ ] Active involvement in spin-off development/business planning
- [ ] Management of equity stakes in spin-off companies
- [ ] Management of proof-of-concept/technology incubation funds or projects
- [ ] Management of incubator facilities

Other (please specify)

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Quantification of Research Effort

14. Please give the aggregate Research Expenditures in FY2014 for all PRO(s) for which your KTO is the major provider of Knowledge Transfer Services.

[Include share of academic costs dedicated to research (e.g. salary costs permanent academic staff, costs of administrative support, capital expenditures on new equipment. Exclude cost of new buildings or land]

15. What percentage of the total research expenditure of your PRO(s) in FY2014 was covered by the following financial sources:

Industry	
Government and government-funded granting bodies/agencies (except EU)	
Donations/Charities	
EU sources (including, but not limited to framework programs)	
Other	

16. If part of the research expenditure for your PRO(s) reported under the previous question is covered by 'Other' sources, please specify the source:

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Quantification of Research Effort (2)

17. What was the (combined) research effort of your PRO(s) in FY2014, expressed in Full Time Equivalents (FTEs)?

[Include time spent by academic staff on research (also include FTEs for post-docs, PhD students, research fellows, technicians and the like). Exclude time spent by staff on teaching]

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Research and Consultancy Agreements with Industry

18. Please provide the number of agreements with industry that were concluded in FY2014:

Number of new Contract Research Agreements	
Number of new Collaborative Research Agreements	
Number of new Consultancy Agreements	

19. Please provide the aggregate value (in FY2014 + future years) of agreements with industry that were concluded in FY2014:

Aggregate value of new Contract Research Agreements **(€)**	
Aggregate value of new Collaborative Research Agreements **(€)**	
Aggregate value of new Consultancy Agreements **(€)**	

Income from industry agreements that were executed in earlier years should NOT be counted.

20. Please give the number of different companies with which your PRO(s) has executed the agreements given under question 18

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Invention disclosures, patent applications and patent grants

21. What is the number of invention disclosures received in FY2014?

[Descriptions of inventions or discoveries that are evaluated by the KTO staff or other technology experts to assess their commercial potential]

22. Please give the total number of priority patent applications filed in FY2014.

[a priority patent application constitutes the first patent application for a technically unique invention. If priority patent applications relating to the same technically unique invention are submitted simultaneously in multiple patent offices, or are submitted after the first priority patent application within the priority year, only a single priority application should be counted]

23. How many patents were first granted in FY2014?

[The first grant in any territory of a patent for a technically unique invention. Count a patent grant for the same invention in two or more countries as one technically unique patent. If a first patent grant for a technically unique invention has been counted in a previous year, no further patent grants for such invention should be reported]

24. What is the total number of patent families in the patent portfolio of your KTO that are active at the end of FY2014?

[A patent family is a collection of patent applications and granted patents that relates to a single invention]

25. Please give the percentage of active patent families in the patent portfolio (see previous question) that is licensed or optioned at the end of FY2014.

[include both patent applications and granted patents for which as of the end of the reference year an option agreement or a license agreement has been executed)

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Licenses, options and assignments involving IP

26. What is the total number of IP agreements executed in FY2014?

[Please include all licences, options and assignments (LOAs) for all types of IP (copyright, know-how, patents, trademarks, etc.). Count multiple (identical) licences with a value of less than 500 Euros each as one licence. A licence grants the right to use IP in a defined field of use or territory or for a particular period of time. An option grants the potential licensee a time period to evaluate the technology and negotiate the terms of a licence. An assignment transfers all or part of the ownership of IP to a third party]

27. Out of all IP agreements executed in FY2014, how many were:

Licenses (not including MTAs for research materials)	
Options	
Assignments	
Material Transfer Agreements for licensing the use of research materials	

28. Of all the IP agreements reported for FY2014 above, what number involved:

Open source licenses for software	
Closed source licenses for software	

29. Approximately, what percentage of all licenses or options were granted as worldwide, exclusive for all fields-of-use in FY2014?

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Commercial Revenues

30. What are the gross revenues from commercialisation of IP earned in FY2014?

[Gross revenues from the commercialisation of all types of know-how and IP (e.g. patents, copyright, designs, trademarks, software, trade secrets etc.) before distribution within the PRO or to inventors. Include license issue fees, annual fees, option fees, milestone payments, running royalties, change-of-control payments, dividends and proceeds from liquidation events. Exclude license income forwarded to third parties other than individual inventors]

31. Of the gross commercial revenues reported in Question 30, approximately what percentage was generated by the following:

Patents	
Software	
Copyright (excluding software)	
Trade secret/Know-how	
Trademark	
Breeders' rights	
Maskworks for semiconductors	
Research materials	
Database rights	
Other	

Total must equal 100%

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Spin-offs and start-ups

32. How many spin-offs were established in FY2014?

[A spin-off is a company expressly established to develop or exploit IP created by a Public Research Organization and with a formal contractual relationship for the use of this IP. Include, but do not limit to, spin-offs established by PRO staff. Exclude start-ups that have no formal agreement for commercially developing IP or know-how created by the institution]

33. How many start-ups were established in FY2014?

[A start-up is a newly registered company that is not directly involved with the exploitation of intellectual property generated within a Public Research Organization served by the KTO]

34. What is the total investment from private sources in all spin-offs and/or start-ups associated with your KTO in FY2014?

[Include investments in companies that were founded in earlier years. Include equity funding or loans from professional investors, financial institutions, business angels or company management; exclude equity funding, grants/donations or loans from the PRO or government agencies]

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Survey completed

On behalf of the ASTP-Proton Survey Committee:

Thank you very much for participating in this survey.

Massimiliano Granieri,
Chair of the Survey Committee
Vice President ASTP-Proton