



Summary Report for Respondents: The ASTP Survey for Fiscal Year 2006

September 24, 2007

Anthony Arundel¹ & Catalina Bordoy¹

Report produced by UNU-MERIT
for the Association of European
Science and Technology
Transfer Professionals

¹ UNU-MERIT: Maastricht Economic and social Research and training centre on Innovation and Technology. Tel: 31 43 388 4452. Email: A.Arundel@merit.unimaas.nl; C.bordoy@merit.unimaas.nl.

1. INTRODUCTION

Technology transfer offices (TTOs) play a key role in the commercialisation of publicly funded research. Many of the activities of TTO staff are tacit and difficult to measure, but other activities, such as assisting with patent applications or helping to establish start-up firms, can be identified and measured.

In the spring of 2007, MERIT conducted a second survey on behalf of the Association of Science and Technology Professionals (ASTP) on the technology transfer activities of ASTP members representing universities and other public institutes. The latter includes academic hospitals, government or non-profit research institutes, and research parks or incubators affiliated with these public institutions.

The survey response rate was 67.3%, with 76 responses from ASTP members representing universities and 24 responses from ASTP members representing other public institutes. Responses were received from 22 European countries.

The survey collected information on the types of technology transfer services provided by each Technology Transfer Office (TTO) and data on seven performance measures in 2006: invention disclosures, patent applications, patent grants, new start-ups, license agreements, license income, and research agreements.

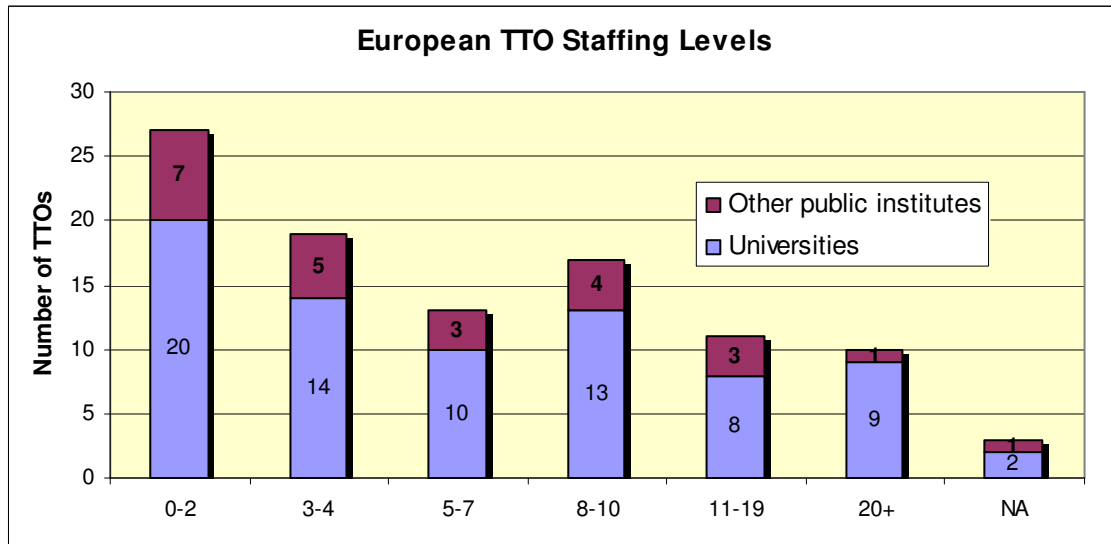
Some of the ASTP results for 2005 from the earlier 2006 survey are compared with the results of the 2005 survey of American TTOs conducted by the Association of University Technology Managers (AUTM)². In order to be able to combine results across European countries and to compare them with the AUTM data for the United States, all ASTP financial data are given in US dollar purchasing power parities (PPP\$), using OECD data on PPPs for each European country.

This report summarizes the main results of the ASTP 2007 survey. The complete report is available from ASTP.

² No AUTM results are available yet for fiscal year 2006.

2. CHARACTERISTICS OF THE TTOs

Figure 1



NA = Not Available (respondent did not report results).

The average TTO has 8.1 staff members. Universities have higher staffing levels, with an average of 8.6 personnel, compared to an average of 6.7 personnel for TTOs serving other public institutes. Figure 1 gives the distribution of staffing levels.

University TTOs are slightly older, with an average age of 10 years since establishment, compared to an average age of 9 years for TTOs that serve other public institutes. Older TTOs have more staff members than younger TTOs. This partly explains the difference in staffing between TTOs serving universities versus other public institutes.

For 77% of the TTOs, intellectual property (IP) rights belonged to the affiliated institutions, for 12% the IP rights were held either by the institution or by others (usually the inventor or the government), and for 11% the affiliated institution did not own any of the IP, with the rights held by the inventor.

3. INVESTMENT IN RESEARCH

Table 1. Research investment by affiliated institutions in 2006

	Research personnel		Research expenditures (million PPP\$)	
	Mean	Total	Mean	Total
Universities	2,101	134,489	115.6	6,127
Other public institutes	1,615	33,922	122.6	1,962
Total	1,981	168,411	117.2	8,089

Investment in research by the TTO’s affiliated institution is measured through the number of research personnel and total expenditures on research (in million US dollar purchasing power parities). Eighty-five respondents provided data on research personnel and 69 provided data on research expenditures.

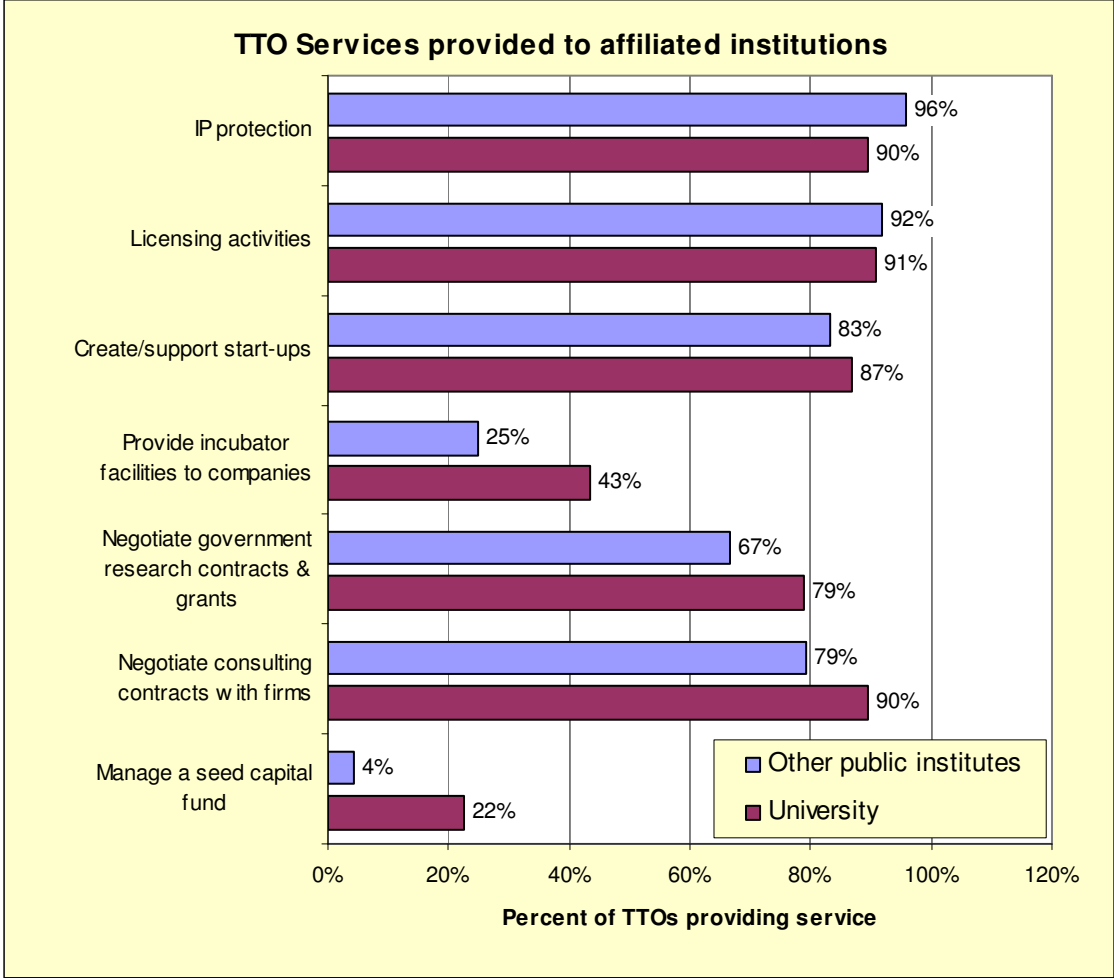
Universities have on average 30% more research personnel than other public institutes. Conversely, the average research expenditures of universities in 2006 is 6% lower than the amount spent by other public institutes: 115.6 million PPP\$ versus 122.6 million PPP\$.

On average, 11.9% of the total reported research expenditures in 2006 were funded by companies. The rate is higher for universities (12.8%) than for other public institutes (9.7%)³.

³ Limited to data from 60 respondents who both estimated the percentage of research funded by companies and gave results for total research expenditures in 2006.

4. TTO SERVICES

Figure 2



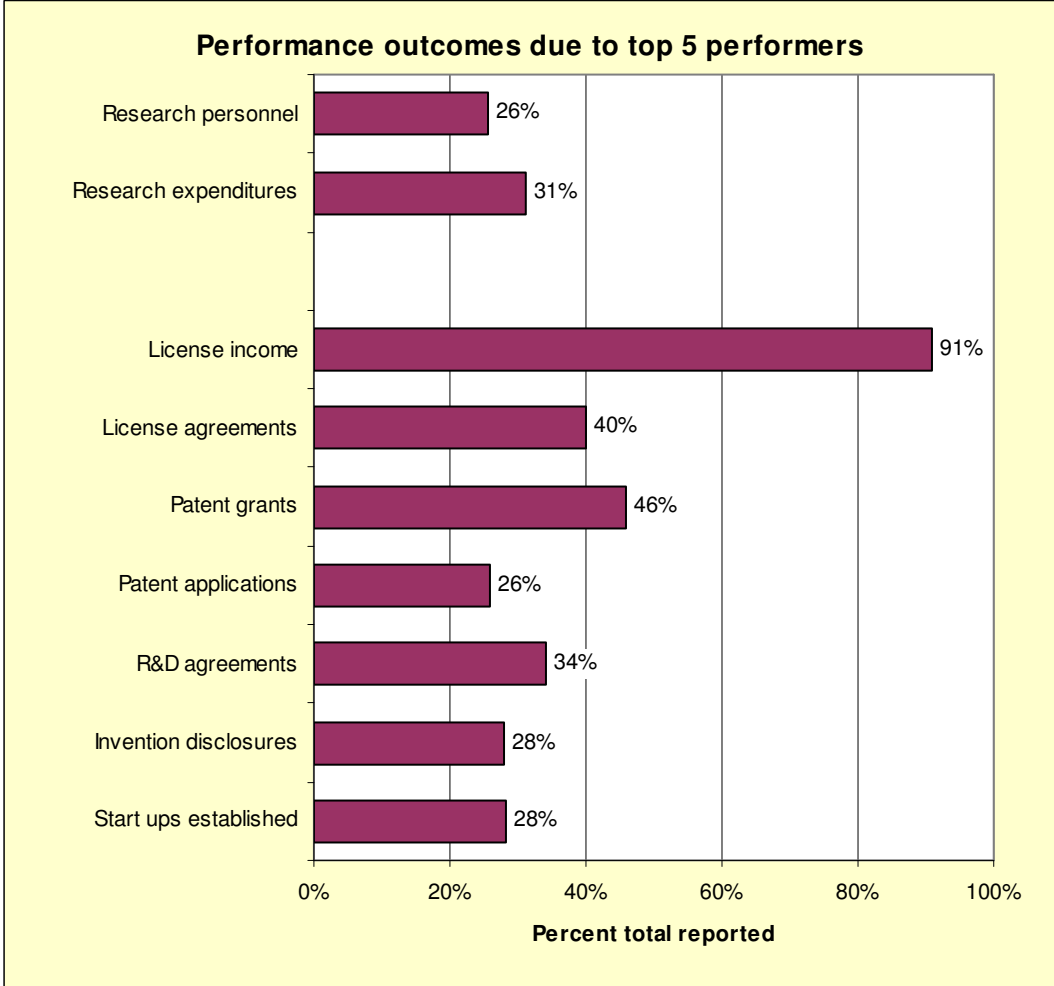
Almost all university TTOs provide intellectual property protection (91%), negotiate or arrange licenses (91.0%), negotiate consulting contracts with firms (87.0) and create or support start-ups (87%). Less than half of the university TTOs provide incubator services to companies (39.0%) or manage a seed fund (18.0%).

There are only a few minor differences between TTOs that are affiliated with universities compared to other public institutes. A higher percentage of university TTOs than TTOs representing other public research institutes provide incubator services (43.4% versus 25%), negotiate government research contracts (78.9% versus 66.7%) or manage a seed fund (22.4% versus 4.2%).

4. PERFORMANCE OUTCOMES

4.1 Performance share of top five institutions

Figure 3



Results limited to firms that reported data for each indicator.

Figure 3 gives the percentage of research expenditures, research personnel, and seven performance measures that were accounted for by the top five performing institutions. For example, five institutions accounted for 31% of all research expenditures reported for 2006. The highest level of concentration is for license income, with five institutions accounting for 91% of all reported license income for 2006. The lowest level of concentration is for the number of patent applications and research personnel, with the top five accounting for 26% of the total reported for 2006.

4.2 Performance per 1,000 research staff

Table 3. Performance per 1,000 research staff in 2006

	Universities	Other public institutes	Total
Invention disclosures	15.6	20.4	16.6
Patent applications	5.5	9.2	6.3
Patent grants	2.6	7.8	3.2
License agreements	4.8	11.6	6.3
License income ¹	0.5 m PPP\$	0.7 m PPP\$	0.5 m PPP\$
Start ups established	1.6	0.5	1.4
Research agreements	110.8	95.8	108.8

1: Results exclude an outlier from the group of 'Other public institutes'.

Table 3 gives standardized performance measures for 2006 per 1,000 research personnel. For example, universities produced, on average, 5.5 patent applications and 2.6 patent grants per 1,000 research staff.

With the exception of the number of start-ups established, other public institutes outperform universities. Per thousand researchers, other public institutes have 1.6 times more patent applications, 2.4 times more license agreements, and 3.0 times more patent grants than universities. This is not surprising, since the government and non-profit institutes that account for most of the 'other public institutes' are likely to perform more applied research than universities and have substantially larger research budgets per researcher. Furthermore, many university researchers will have other responsibilities such as teaching in addition to research.

4.3 Performance by research expenditures

Table 4. Unit outcome costs in million PPP\$ of research expenditure, 2006

	Universities	Other public institutes	Total
Invention disclosures	3.5	4.4	3.7
Patent applications	10.0	9.3	9.8
Patent grants	18.0	17.0	17.8
License agreements	11.1	6.7	9.5
License income ¹	88.4 PPP\$	207.8 PPP\$	99.7 PPP\$
Start ups established	35	140.1	43
Research agreements	0.4	1.2	0.5

1: Results exclude an outlier from the group of 'Other public institutes'. The indicator equals the amount of research expenditures to earn 1 PPP\$ of license income.

Table 4 gives the “cost” in terms of research expenditures for each unit of performance outcome. These are not real costs because many outcomes such as invention disclosures or patent applications would have been developed out of research funded before 2006 and the primary goal of the research was not necessarily to produce such outcomes. Nevertheless, the results provide an indication of the level of investment in public research that is required to produce outcomes such as a start up or a patent with commercial potential.

On average, universities spent 3.5 million PPP\$ on research in 2006 to produce one invention disclosure. One granted patent was produced per 18.0 million PPP\$ in research expenditures, and one PPP dollar of license income was produced per 88.4 PPP\$ of research expenditures.

Universities are more efficient than other public institutes in terms of invention disclosures, start-ups, research agreements and license income, with a lower cost in terms of research expenditures per unit outcome. For example, 35.0 million PPP\$ of research expenditures by universities led to one start-up, but other public institutes spent, on average, 140.1 million PPP\$ on research for each start-up. However, other public institutes perform better for patent applications, patent grants and license agreements.

The age of the TTO office is positively correlated with the number of invention disclosures, patent applications, patent grants, start-ups, license agreements, and license income (there is no effect of the age of the TTO on the number of R&D agreements). However, this is misleading, as the effect of age vanishes when using the efficiency with which research expenditures are turned into outcomes. There is no difference by the age of the TTO in the amount of research expenditures required to obtain each performance outcome.

4.4 Percentage change in performance outcomes 2004-2006

Using the results of the last two editions of the ASTP survey, a matched sample of 62 ASTP members (50 universities and 12 other public institutes) has been constructed containing data from the years 2004, 2005 and 2006.

Figure 4

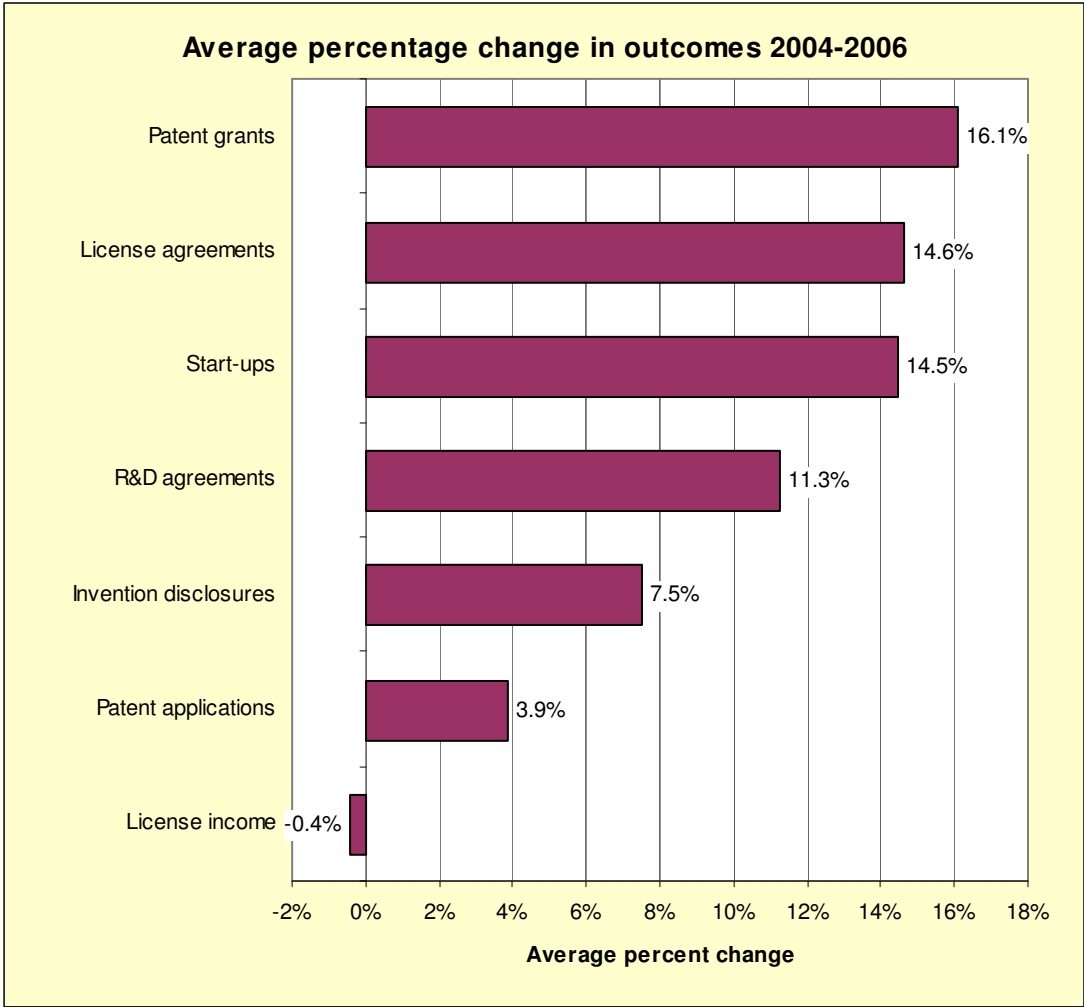


Figure 4 shows the average annual change in outcomes for respondents that reported results for 2004, 2005 and 2006. Except for license income, which slightly decreased, all outcomes improved between 2004 and 2006. The number of patent grants, license agreements, start-ups established and R&D agreements all increased by more than 10% between 2004 and 2006. Conversely, the number of patent applications only increased by 3.9%.

5. ASTP AND AUTM PERFORMANCE

The ASTP Survey for Fiscal Year 2005 compared ASTP and AUTM performance for 2004, but was unable to make a similar comparison for 2005 because the AUTM results were not yet available. This section compares ASTP and AUTM results for 2005. A similar comparison for fiscal year 2006 is not yet possible.

Figure 5

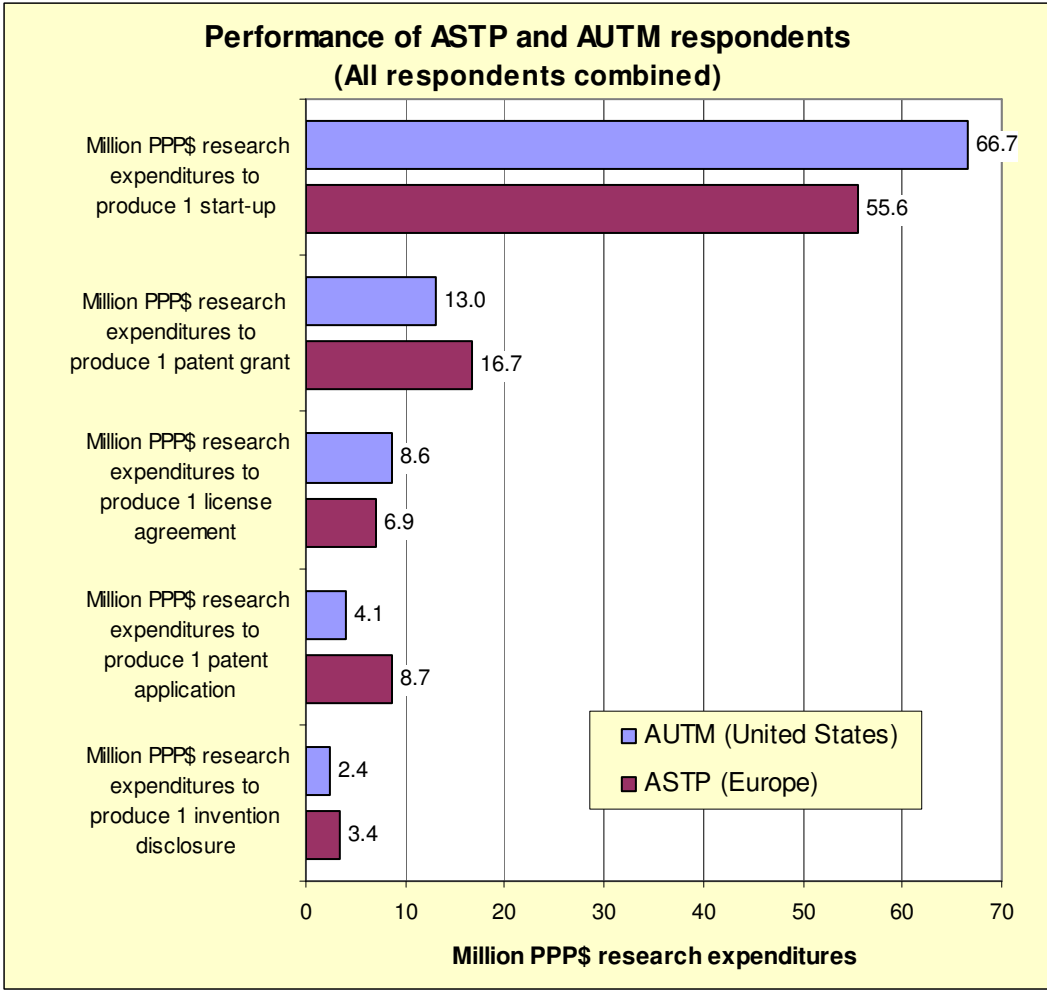


Figure 5 gives the estimated ‘cost’ in million PPP\$ to produce each outcome. These are approximate estimates, since outcomes can depend on research conducted before 2005.

The AUTM institutions are more efficient in producing invention disclosures, filing patent applications and in receiving patent grants than the European ASTP institutions. For example, the AUTM respondents require 13 million PPP\$ to produce one patent grant, whereas the ASTP respondents require 16.7 million PPP\$ per patent grant. Conversely, European ASTP members require a smaller amount of research expenditures to produce one license agreement and one start up than the AUTM institutions. These results suggest that the AUTM institutions are more effective in patenting, particularly for patent applications, but that the ASTP members are more effective in establishing start-ups.

ANNEX: ASTP SURVEY QUESTIONNAIRE

1. Is your office responsible for some or all of the patenting, licensing, or other knowledge transfer activities of the following institutions: (check all that apply)	
<input type="checkbox"/>	General university (both humanities and sciences)
<input type="checkbox"/>	Technical university (mostly science and technology)
<input type="checkbox"/>	Hospital (linked to a university or independent)
<input type="checkbox"/>	Government or non profit research institute
<input type="checkbox"/>	Research park or incubator affiliated with a university, hospital, or research institute
<input type="checkbox"/>	None of the above (go to question 11)
2. Is your office responsible for all patenting and licensing by the institution(s) checked in question 1? (Hereafter referred to as 'your institution')	
<input type="checkbox"/>	Yes (go to question 3)
<input type="checkbox"/>	No Approximately what percentage of all patent applications by your institution was handled by your office in 2006? _____%
3. Which best describes your office: (Please select the most appropriate option only)	
<input type="checkbox"/>	A knowledge transfer office owned by or affiliated to your institution
<input type="checkbox"/>	An independent office that provides knowledge transfer services to institutions
<input type="checkbox"/>	Other (please describe) _____
4. Other information on your office	
•	In what year was your office started? _____
•	In 2006, how many employees (in Full-Time Equivalents) in your office were responsible for knowledge transfer services (include professional, administrative and support staff)? _____FTE
	How many of your office's employees were professional staff directly involved in knowledge transfer activities? _____FTE
5. Who has first rights to the intellectual property rights created at your institution? Check all that apply if ownership can vary	
<input type="checkbox"/>	The institution
<input type="checkbox"/>	The Government
<input type="checkbox"/>	The inventors
<input type="checkbox"/>	Other _____

6. Which of the following knowledge transfer services are provided by your office? (Check all that apply)

- Intellectual property protection through applying for patents, registering designs, etc.
- Licensing activities
- Creating or supporting start-up companies to exploit your institution's inventions (*a start-up is a company that was established to exploit technology or know-how from your institution*)
- Providing incubator facilities to companies
- Negotiating government-sponsored research contracts or grants (regional, national, EU)
- Negotiating consulting contracts or research collaboration contracts with firms
- Managing a seed capital fund

The remaining questions ask for 2006 data on your institution. Please note if your answers refer to a calendar or fiscal year.

- Calendar year (January 1st to December 31st)
- Fiscal year starting _____ day _____ month

Please insert '0' where relevant, or 'NA' if the answer is not available.

7. Invention disclosures and patenting in 2006

- How many invention disclosures (*inventions subject to an evaluation by technology experts*) were reported by your institution to your office? _____
- How many new patent applications (priority filings) did you file for your institution? _____
- How many **technically unique** patents were granted to your institution?
*A technically unique patent grant is for one invention only. Count a patent for the same invention in two or more countries as **one** technically unique patent.* _____
- How many USPTO patents were granted to your institution? _____

8. Start-up companies

(A company established to exploit technology or know-how created by your institution)

- How many start-ups were formed in 2006? _____

Please insert '0' where relevant, or 'NA' if the answer is not available.

9. Licensing activities in 2006

- How many licenses (include assignments) or option agreements were made between your institution and companies? _____
How many of these licenses and option agreements were granted to:
Start-ups _____
Other firms with less than 250 employees _____
- What was the **total** amount of license income earned by your institution from its intellectual property (patents, software, material transfer agreements, confidentiality agreements, etc)? _____
Include license issue fees, annual fees, option fees, etc. Plus milestone, termination & cash-in payments. Exclude license income forwarded to other companies or institutions.
- Approximately what percentage of this license income was from patents? _____ %
- Approximately what percentage of your institution's active patent portfolio has ever been licensed? _____ %

10. Research activities in 2006

- How many research and development agreements were made between your institution and companies? _____
- What is the total number of research personnel at your institution (include researchers, technicians and administrative support)? _____
- What were the total research expenditures of your institution? _____
- Approximately what percentage of your institution's total research expenditures was funded by private companies? _____ %

11. Comments

In order to protect confidentiality, only aggregated results of this survey will be disclosed, unless you agree otherwise:

I give permission to disclose results for my institution Yes No