ICSTI
IRELAND

Irish Council for Science,
Technology and Innovation

ICSTI Statement

A Comparison of Starting Salaries for Science and Engineering Graduates

June 2003

Forfás *Established by the Government and Forfás to advise on Science, Technology and Innovation*

Functions of the Irish Council for Science, Technology and Innovation (ICSTI)

- To advise on science and technology policy-related issues in response to specific requests from the Government (through the Minister responsible for Science and Technology) or from the Board of Forfás.

- To advise the Minister responsible for Science and Technology, the Office of Science and Technology and the Board of Forfás, on the Council's own initiative, on policy for science and technology and related matters.

- To advise the Minister on the strategy for the preparation and implementation of national programmes in science and technology.

- To advise the Minister on the strategic direction for State investment in science, technology and innovation.

- To undertake from time to time such other functions as the Minister may decide. In this case the information sought is to be submitted to the Minister.

Contents

List of Tables and Figures

Executive Summary

Salary plays a major role in decision making when people select a profession and career. When second level students contemplate their career selection, perceived future salary prospects will influence the subjects that they will take for their junior and leaving certificate examinations. Anecdotal evidence suggests that starting salary levels for science and engineering graduates are not competitive with those of other professions.

The Task Force on the Physical Sciences (2002), chaired by Dr Daniel O'Hare, investigated the decrease in take-up of the physical sciences subjects at primary and second levels of education. It identified factors to which the decrease could be attributed. The Task Force put forward recommendations to both promote the take-up of the physical sciences subjects at primary and second level education and to retain levels of take-up.

The Irish Council for Science Technology and Innovation (ICSTI) considered that, in the context of the findings of the recent Task Force on the Physical Sciences (2002), salary plays a significant role both in attracting students into the Science and Engineering professions, in retaining the number of graduates at postgraduate levels and in the provision of the skills required by the Science, Engineering and Technology (SET) dependant industries. If it is indeed correct that starting salary levels for science and engineering graduates are not competitive with those of other professions, than this must certainly be considered to be a major adverse factor contributing to the decline in the take-up and retention in the physical sciences, biology and mathematics subjects.

In this Statement The Irish Council for Science Technology and Innovation (ICSTI) examined this anecdotal perception that starting salaries for science and engineering graduates are not competitive with those of other professions, and makes recommendations accordingly.

Specific conclusions that can be drawn from the information compiled for this study are:

1. Starting salaries for science, engineering and technology (SET) graduates are competitive with those of the principal non-SET profession to which SET graduates migrate;
2. Salary is the third most important factor, after interest in the area and perceived job availability, for second level students when selecting the area of study that they are interested in when completing the CAO application;
3. Gross postgraduate stipends equate favourably to starting 'net-salary' in industry. However, when postgraduate registration fees are deducted from student stipends, this reduces the net payment to postgraduate students;
4. Some gender associated salary differential is evident at Certificate and Diploma levels;
5. The highest paying industries for SET graduates are software development, medical / pharmaceutical and engineering (non-specified);
6. A very significant migration from science to business / financial sector professions has been noted for Primary Degree graduates in science. This migration was very much lower for engineering graduates.

There is a lack of published data on the subject of salaries for science and engineering graduates both nationally and internationally. Nationally, the Higher Education Authority (HEA) maintains and publishes a database on first career destinations of graduates. Although limited for the purposes of examining salaries, it is the most comprehensive national data source available. Information from other countries is sparse and, with the exception of the United Kingdom, not readily comparable to the Irish scenario. It was not possible to identify 'central' data / information

sources in other EU Member States, the USA or Japan that could provide any national or regional information that would be comparable. The most comparable information obtained was from sources in the United Kingdom.

In spite of the lack of coherent information available, the need for information exists. A comprehensive national database would also provide data and information to support the formulation of national policy/strategy developments and impact assessment.

ICSTI makes the following recommendations:

1. That the research funding agencies in conjunction with the third level research institutions ensure that:

i. their postgraduate stipends and their postdoctorate salaries for new science and engineering graduates are competitive with the relevant 'net starting salaries' offered by industry in Ireland;

ii. the postgraduate stipends and postdoctorate salaries are competitive with those offered by research institutions in competitor countries such as the United Kingdom; and

iii. consideration be given to the funding agencies paying postgraduate fees and support subventions directly to the third level institutions.

2. That, whilst acknowledging market forces, industry recruitment policy should endeavour:

i. to reflect the level of academic qualification attained (i.e. Certificate, Diploma, and Primary and Higher Degree levels), in starting salaries for science and engineering graduates; and

ii. to ensure that any gender-based differential is negated.

3. That the findings on the competitiveness of the postgraduate stipends and average starting salary for science and engineering graduates be proactively promoted by all stakeholders, in line with the national endeavour to increasing take-up and retention in the science and engineering subjects.

4. That the Higher Education Authority:

   i. take action to develop a database containing longitudinal information on Irish graduate destination, to include the current data capture on the destinations of graduates 9 months after graduation and to extend this data capture to include Irish graduate destination at fixed period thereafter, e.g. after 3 and 7 years;

   ii. in conjunction with other relevant agencies / bodies such as the Expert Group on Future Skills Needs, to conduct a feasibility study on the collection of such data, recognising that the current First Destinations Report would not be an efficient or effective method for such data collection.

Introduction

The Task Force on the Physical Sciences (2002), chaired by Dr Danny O'Hare, investigated the decrease in take-up of the physical sciences subjects at second and third levels of education. It identified factors to which the decrease could be attributed and put forward recommendations to promote both the take-up of the physical sciences subjects and the retention of attained levels through second and third levels.

Sir Gareth Roberts[1] (United Kingdom) carried out a review of Science, Engineering and Technology (SET) and assessed second and third levels of education in the United Kingdom. The Roberts' review (Roberts, 2002), which was published at the same time as the 'O'Hare report', also highlighted the decrease in take-up and retention levels in the SET subjects. Several similarities were identified between the two reports, especially on retention levels of students in SET subjects. Furthermore, the Expert Group on Future Skills Needs (EGFSN) has published studies concerning research and engineering skills that provide a further background to the current study.

In spite of the general decline in the take-up of the science and physical science subjects, Irish production of science and engineering graduates compares favourably with other OECD countries (Table 1, Appendix 1).

1 *Chair of United Kingdom Government Treasury Task Force on Review of Science, Engineering and Technology (SET).*

Table 1 - Tertiary graduates in EU Member States, by field of study and level of education (2000) (percentage of all subject categories).

	Engineering, manufacturing and construction	Agriculture	Life sciences	Physical sciences	Mathematicsl and statistics	Computing
Degree Level						
OECD mean	13.2	2.3	3.1	3.0	1.1	3.1
Ireland	9.3	1.7	6.9	3.3	1.1	8.4
Sub-Degree Level						
OECD Mean	14.7	2.4	n	n	n	6.8
Ireland	19.6	0.7	2.7	4.5	n	17.8

Source: Education at a glance. OECD Indicators 2002.

The Irish Council for Science Technology and Innovation (ICSTI) considered that, in the context of the findings of the recent Task Force on the Physical Sciences (2002), salaries play a significant role both in attracting students into the Science and Engineering professions, in retaining the number of graduates at postgraduate levels and in the provision of the skills required by the Science, Engineering and Technology (SET) dependant industries.

Anecdotal evidence suggests that starting salary levels for science and engineering graduates are not competitive with those of other professions. Such a scenario may well be considered a further adverse factor contributing to the decline in the take-up and retention in SET subjects and related employment. ICSTI agreed to examine this perception and make recommendations accordingly.

After examining data on graduate starting salaries, it became clear that, both in Ireland and other European countries, there is a lack

of published information on the subject of salaries for science and engineering graduates. The period 1995 – 2000 was identified as the timeframe for which the most extensive and most current data could be provided and analysed.

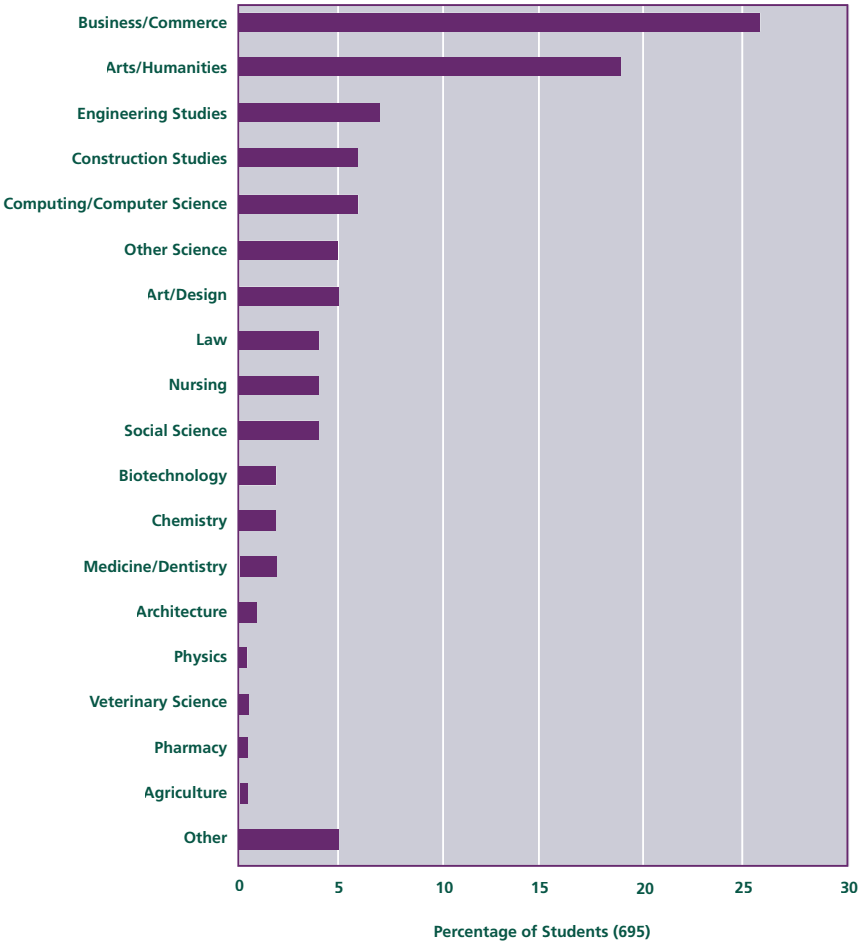
The Higher Education Authority (HEA) publishes annually the "First Destination of Awards Recipients in Higher Education". Other published sources of information include individual studies, recruitment agencies and newspaper articles. Information from other countries is sparse and, with the exception of the United Kingdom, not readily comparable to the Irish data. It was not possible to identify 'central' data / information sources in other EU Member States, the USA or Japan that could provide any national or regional information that would be comparable. Some professional associations had selective information which is difficult to use in a relatively objective manner. The most comparable information was that from sources in the United Kingdom. Other organisations such as Eurostat and the OECD were also approached but without any success.

In contrast to the anecdotal evidence about the significance attached to salaries and career choice, the MRBI recently carried out a study of second level students who completed their CAO applications (MRBI, 2002). In terms of ranking the most important influences on choice of a third level course:

- More than half of all students mentioned strong interest in career;
- Job availability and salary were ranked next in importance. Female students, particularly those in girls-only schools, are more likely to be influenced by a strong interest in the career;
- Job availability is slightly more important to those in vocational schools, while salary has more influence for male students and those in boys-only schools;

- The most favoured choices were Business / Commerce and Arts / Humanities (Figure 1);
- Relatively low proportions of students indicated that they would consider a career in the areas of construction, engineering, computing and science; roughly 3 out of 10 would consider these subjects (Figure 1). Construction, engineering and computing careers hold more appeal for males than females, with the opposite being the case for a career in science;
- The main attractors for these careers are strong interest by the students, followed by perceived job availability and salary;
- Principal deterrents for the take up of SET subjects include length of study, lack of interest and perceived job availability.

Figure 1 - The areas of study that students indicated as their preferences around the time of completing their CAO applications.



Source: MRBI, 2002. Factors Influencing CAO Choices. Presentation by MRBI to Forfás. September 2002.

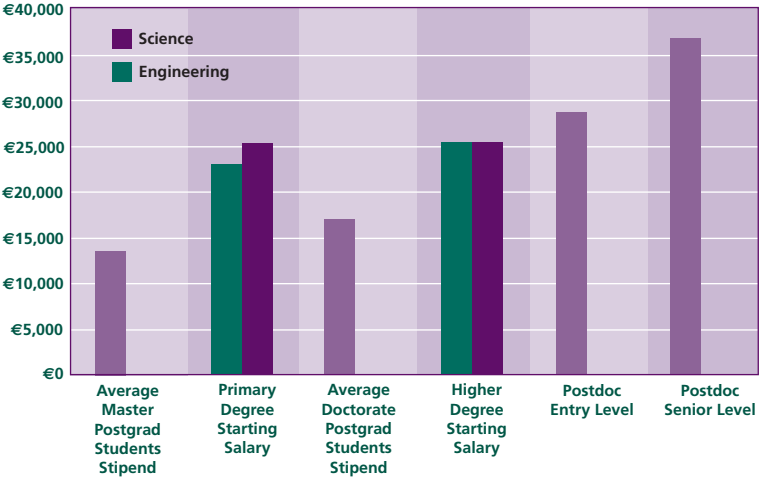
1. Science and Engineering Students' Stipends

1.1 Ireland.

For those considering postgraduate study or research, the stipend that a student receives when registered and engaged in postgraduate studies, compared to starting salaries available on taking up employment immediately after graduation, is a factor that will obviously play an important role in determining whether one continues on to postgraduate studies or takes up salaried employment. Industry requires a continuous supply of high skills and this calls for a significant proportion of undergraduates to take-up postgraduate studies. It appears that an attractive salary has become a critical factor in influencing the take-up of postgraduate studies. Anecdotal evidence suggests an increasing temptation to abandon postgraduate options for better pay in industry, especially in a buoyant economy. In order to encourage take-up and retention in postgraduate studies, both the level of postgraduate stipend and the starting salary for recent graduates outside the postgraduate arena should be comparable.

Figure 2 compares the stipends for students registered for an MSc degree, a PhD degree or Postdoctorate in Ireland and the relevant 'starting gross salaries' in industry following the completion of a primary and higher degree.

Figure 2 - Comparison between average postgraduate stipends and starting gross salaries (2000); Ireland.



Source: Enterprise Ireland; HEA First Destination of award recipients in higher education 2000; CHIU[2] National Research Assistant salaries.

Currently Enterprise Ireland is the only major funding institution that provides stipend guidelines. These guidelines have largely been adopted by other funding agencies, creating a reasonable uniformity at national level. Currently stipends[3] of between €15,000 and €20,000 are allowed in research contracts with the third level sector, but are inclusive of fees[4]. The actual stipend awarded to postgraduate research students, registered for an MSc or PhD degree, not only varies between the third level institutions but also between certain disciplines such as computer science, engineering and physics. Currently it is difficult to recruit engineering postgraduates; hence stipends offered are in excess of €20,000 per annum.

2 Council of Heads of Irish Universities.

3 Enterprise Ireland & IRCSET recommended stipend levels for third level research contracts (30Apr03) - Postgraduate stipend range e 13,000 - e 20,000 inclusive of fees; Postdoctoral e 30,000 - e 40,000.

4 Postgraduate fees (average) are: Master registered e 2,500; Doctorate registered e 3,000.

The differential in gross pay for postgraduate stipends and starting salaries varies between 21% and 38%. The effective disposable income however is influenced by deductions in income tax and postgraduate registration fees. Students registered for an MSc or PhD degree can apply to the Revenue Commissioners for income tax and PRSI exemption, which is normally granted. However, postgraduate student registration fees often have to be paid out of the stipends paid.

The salaries of recent graduates are subject to income tax and PRSI deductions. For the purposes of comparing stipends and salaries, it is assumed that a postgraduate student / graduate is a single person without any liabilities / assets which can be offset against income tax allowances, apart from the income tax deductible entitlements. Table 2 shows a comparison of net incomes between postgraduate student stipends and recent graduate starting salaries.

Table 2 - Comparison of median net incomes (starting salaries) for science and engineering graduates and eligible median stipends for postgraduate and postdoctoral registered researchers.

Level of Education attained	Discipline	Gross Income	Net Income[5]
Primary Degree	Science	€23,000	€16,417
(Bachelor level)	Engineering	€25,400	€19,365
Higher Degree	Science	€25,400	€18,222
(Master and PhD)	Engineering	€25,400	€19,365
Postgraduate	MSc and PhD	€15,000 to	€13,000 to
(Stipend range)	registered	€20,000	€18,000[6]
	Postdoctorate	30,000- 40,000 excl. 10.75% PRSI	

5 *Net Income = Gross salary - Tax Credits (Single Person Rate) - (20% income tax + Class A1 PRSI deduction - 2% on first e 6,604, 6% remainder).*

6 *Deduction is an average University registration fee.*

When comparing the disposable income between postgraduate student and recent graduates employed, the disposable income of postgraduate students is lower, ranging from 7% to 33% and €1,365 - €6,365 in actual terms.

If postgraduate registration fees were not required to be paid from stipends, the disposable income of stipends would equate more favourably with the net income of starting salaries for recent graduates.

Both industry and academia often acknowledge as acceptable that postgraduate stipends are less than the starting salary for graduates. It is considered that "……this is an investment in one's future ……." and that full and appropriate remuneration will be obtained upon the successful completion of postgraduate studies, duly reflecting the differential in qualifications. However, taking cognisance of the increased materialistic disposition of the age - group making the choice between "real money now" versus "theoretical' money later, this 'philanthropic' philosophy may not always be applied by graduates. Market forces will have a further influence on job availability and salaries. In a buoyant market, the materialistic nature may prevail whilst an increase in postgraduate take-up may prevail in a market slowdown.

1.2 United Kingdom.

The background and conditions of student stipend payment in the United Kingdom are similar to those in Ireland, although Master and Doctorate stipend levels are higher within the greater-London area. As in Ireland, Master and Doctorate stipends are not subject to income tax. Stipends allocated to Master and Doctorate students in the United Kingdom are exclusive of registration fees. The Department of Education and Skills (United Kingdom) have stipulated that fees are paid separately to the university by the research councils. In Ireland no such distinction is made. Adoption of the United Kingdom approach by the funding agencies here would greatly

contribute to the transparency of payments to student stipends and to fees and support subventions to the third level institutions.

For postgraduates in the Life Sciences, the BBSRC[7] has adopted a strategy to set its stipends above the Government minimum, aiming to attract the best students into research careers in the biological sciences in the face of strong competition from alternative forms of employment for graduates. Hitherto, BBSRC has paid the same stipends for Masters students as for PhD students, and this policy will continue at least until the end of academic year 2003 - 2004.

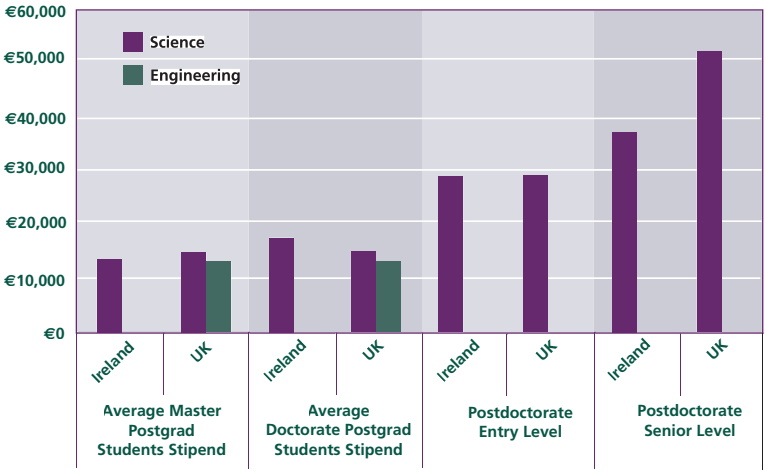
For the engineering postgraduates, EPSRC[8] Master's level funding is provided as a block grant for each course through Master's Training Packages and EPSRC no longer pays a fixed stipend to students. Universities are free to use the funds flexibly taking account of supply and demand. There is no requirement to pay a minimum stipend and in many cases only a contribution to maintenance costs is on offer. All eligible EPSRC Doctoral students must receive at least the national minimum rate.

The Irish stipend at doctorate level is slightly higher than in the United Kingdom, but at senior postdoctorate level, the salary in the United Kingdom is significantly higher (Figure 3).

7 Biotechnology and Biological Sciences Research Council, United Kingdom.

8 Engineering, Physical Sciences Research Council, United Kingdom.

Figure 3 - Comparison between Masters and Doctorate stipends and Postdoctorate salaries in Ireland and the United Kingdom (2000).



ICSTI recommends:

That the research Funding Agencies in conjunction with the third level research institutions ensure that:

i. their postgraduate stipends and their postdoctorate salaries for recent Science and Engineering Graduates are competitive with the relevant starting 'net-salaries' offered by industry in Ireland;

ii. the postgraduate stipends and postdoctorate salaries are competitive with those offered by research institutions in competitor countries such as the United Kingdom; and

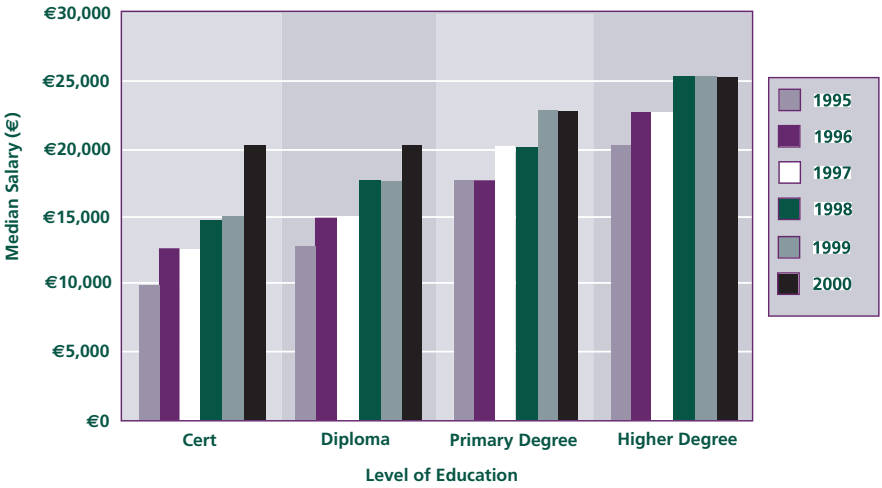
iii. consideration be given to the funding agencies paying postgraduate fees and support subventions directly to the third level institutions.

2. Profile of Starting Salaries for Science and Engineering Graduates in Ireland

2.1 Science graduates

During the period 1995 – 2000 salaries increased for all levels of qualification; certificate, diploma, primary and higher degree. A relatively greater increase in salaries is evident at Certificate level qualification (103%) than at Higher Degree level qualification (25%). In 2000, the median starting salary difference between Certificate and Higher Degree qualification was €5,000 (Figure 4).

Figure 4 - Science Graduates - Median Starting Salary from 1995 to 2000 - By level of qualification.



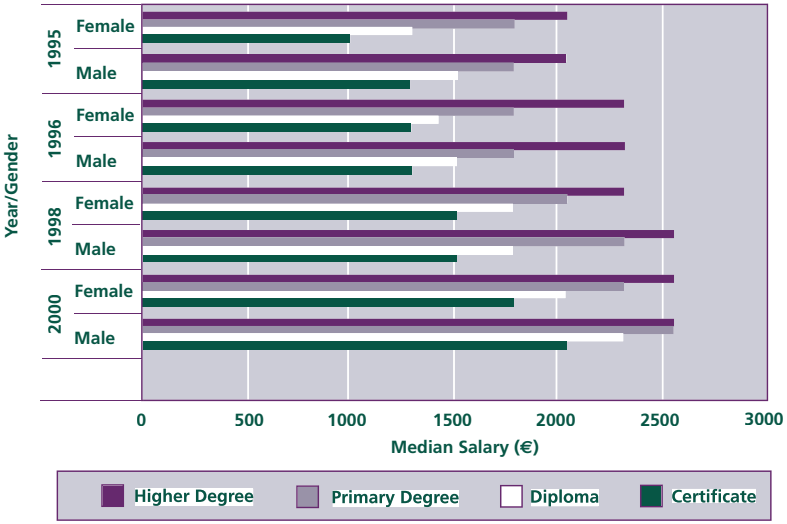
Source: HEA First destination of award recipients in higher education 1995 - 2000.

The annual rate of median salary increase during the 1995 – 2000 period also shows that the rate of salary increases is more progressive for the science Certificate and Diploma levels than for the Primary and Higher Degree levels. Increases appear to occur in 2 year cycles. Whilst the median starting salary for Certificate level doubled during the 1995 – 2000 period, there was a 29% and 25%

increase for the Primary and Higher Degree levels respectively. When sorted by gender, some differences are evident between the median starting salaries at the four levels of education attained (Figure 5). A small gender based differential is evident for Certificate and Diploma levels for all years during the 1998 – 2000 period, and the period 1998 – 2000 at Primary Degree level. At the Higher Degree level no gender based distinction is evident. The differential noted in Figure 5 in 1998 at Higher Degree may well have its origin in the statistical approach applied to the data available. No data was available to ascertain whether any of the gender based differentials were due to:

- salary payments biased on gender or
- the specific employments taken up by the graduates which emphasised gender preferences.

Figure 5 - Science Graduates - Median Starting Salary from 1995 to 2000 – sorted by gender and level of qualification.

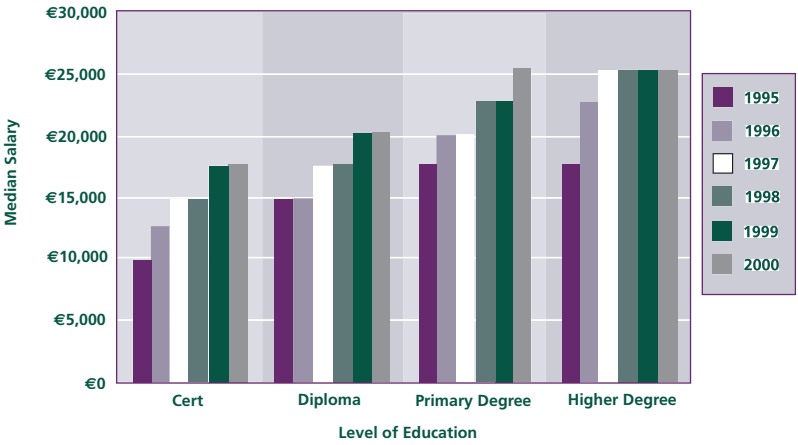


Source: HEA First destination of award recipients in higher education 1995, 1996, 1998 and 2000.

2.2. Engineering graduates

During the 5 year period 1995 – 2000 increases occurred for all levels of qualification (certificate, diploma, primary and higher degree). A relatively greater increase is evident at Certificate level qualification (78%) than that shown for Higher Degree level qualification (43%). In 2000, the median starting salary difference between Certificate and Higher Degree qualification was €7,600 (Figure 6).

Figure 6 - Engineering Graduates - Median Starting Salary from 1995 to 2000 - By level of qualification.



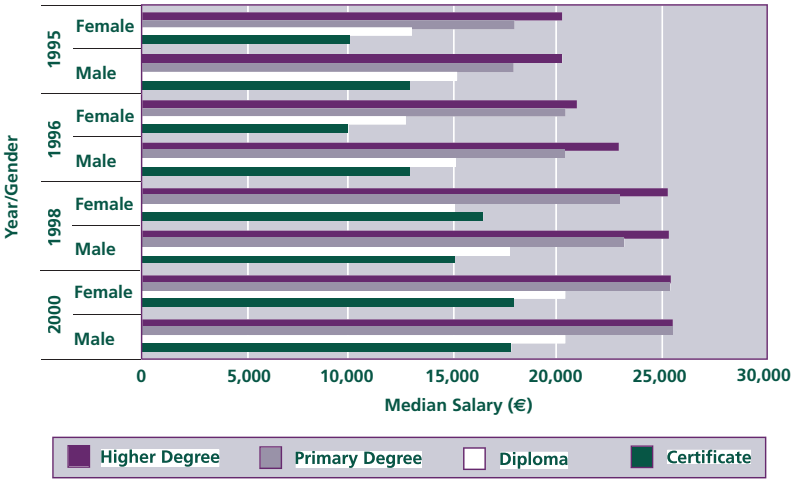
Source: HEA First destination of award recipients in higher education 1995 - 2000.

The annual rate of median salary increase during the period 1995 – 2000 shows that the rate of salary increases is more progressive for the engineering Certificate and Diploma levels than for the Primary and Higher Degree levels. No salary increases were apparent for the Higher Degree level during the 1997 – 2000 period. Furthermore, in 2000 the salary differential between Primary Degree and Higher Degree appears to have converged. Whilst the median starting

salary for Certificate level increased by 78% during the 1995 – 2000 period, there was only a 35% and 43% increase for the Diploma level, and Primary and Higher Degree levels respectively. These trends may well reflect the economic principle of supply and demand during the upsurge in the Irish economy and construction industry. Whilst it is expected that the salary differential between levels of qualification will be restored, the rapid escalation in salaries due to skills shortages in a time of an economic upsurge will affect the market value of graduates.

A gender based differential is evident for Certificate and Diploma levels for all years during the 1995 – 1998 period, but not in 2000. At the Primary Degree and Higher Degree levels no gender based distinction is evident during the period 1995 – 2000. The differential in 1996 for Higher Degree level may well have its origin in the statistical approach applied to the data available (Figure 7).

Figure 7 - Engineering Graduates - Median Starting Salary from 1995 to 2000 – By gender and level of qualification.



Source: HEA First destination of award recipients in higher education 1995, 1996, 1998 and 2000.

No data was available to ascertain whether any of the gender specific differentials were due to:

- salary payments biased on gender, or
- the specific employments taken up by the graduates emphasising gender preferences.

ICSTI recommends:

That, whilst acknowledging market forces, industry recruitment policy should endeavour:

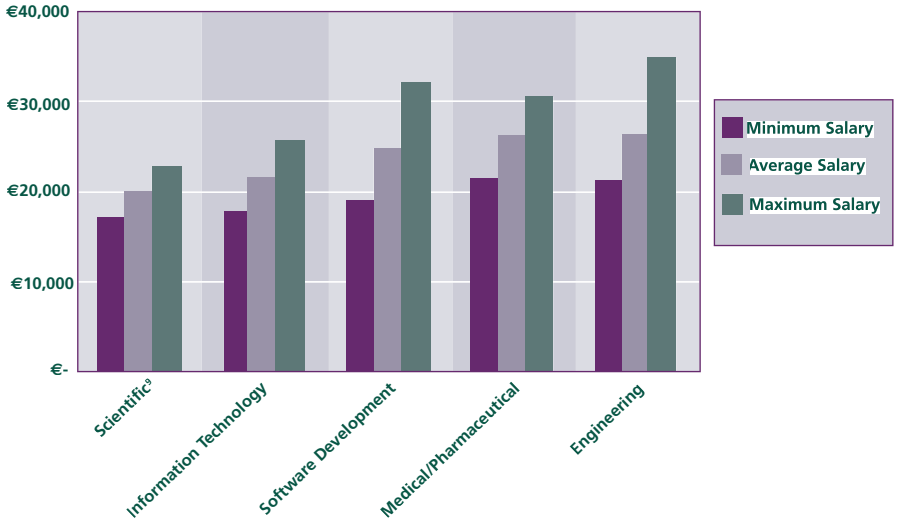
i. to reflect the level of academic qualification attained (i.e. Certificate, Diploma, and Primary and Higher Degree levels) in starting salaries for science and engineering graduates; and

ii. to ensure that gender-based differentials do not occur.

3. Profile of Science/Engineering Graduate Starting Salaries Versus other Professions

The highest paying industries for Science, Engineering and Technology (SET) graduates are software development, medical / pharmaceutical and engineering (non-specified) (Figure 8).

Figure 8 - Comparison of SET graduates' starting salary range in SET areas of employment.

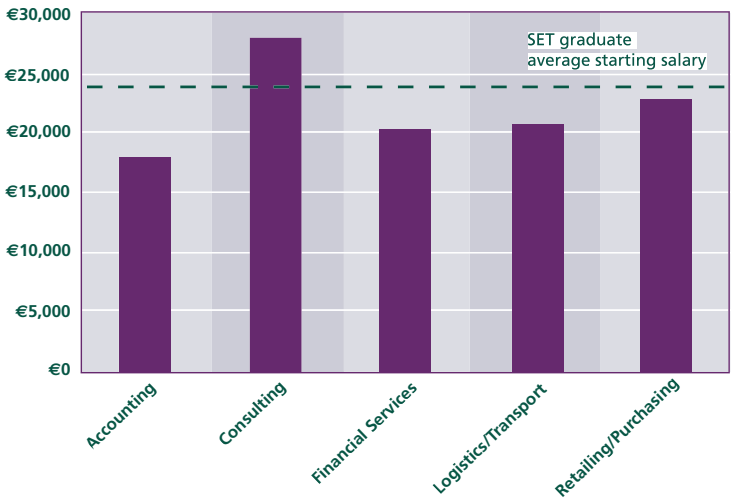


Source: Finfacts, Graduate Recruitment Salary Survey 2001.

Although certain SET professions are well paid, graduates continually search for best opportunities. This manifests itself in the migration of SET graduates to non-SET professions. The main non-SET professions to which SET graduates are attracted include accounting, consulting, financial services, logistics / transport and retailing / purchasing. When comparing the starting salaries for these non-SET professions with the average SET starting salary, it is evident that the average SET starting salary is very competitive (Figure 9). If migration to non-SET professions occurs in spite of a competitive starting salary in the SET area, than it is most likely that other career associated factors are influencing the career decision making process. There is no evidence to suggest what arguments influence this decision making process.

9 *Scientific - Professional and technical support*

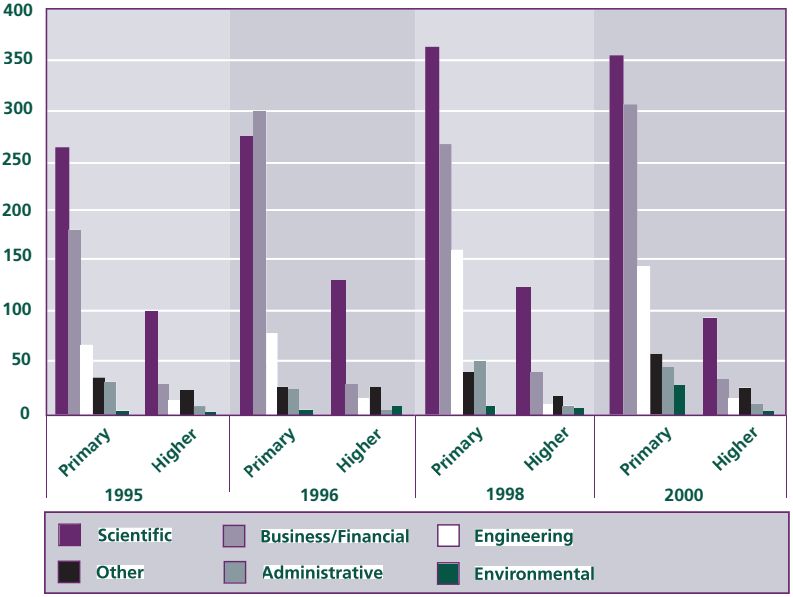
Figure 9 - Graduate Average Starting Salary for alternative professions pursued by SET graduates (Ireland, 2001).



Source: Finfacts, Graduate Recruitment Salary Survey 2001

The loss of SET graduate skills to other areas of the labour market is experienced by both the Primary and, to a lesser extent, the Higher Degree levels. No data is available for Certificate and Diploma levels. The migration away from SET is especially evident for science graduates. Up to 50% of science graduates with a primary degree are leaving science. A significant number appear to pursue employment in the Business / Finance sectors, whilst engineering appears to be a third option (Figure 10). There is no evidence to suggest any specific reasons for this dramatic outward migration. It has been shown that starting salary is an unlikely factor. Migration of science graduates from SET to non-SET areas can be viewed in a positive light because it demonstrates that SET skills are adaptive, flexible and relevant. It might also be expected that the presence of SET skills in non-SET professions would create a more positive attitude by society towards SET in the longer term. However, this outward migration pattern runs counter to the increasing demand by industry for science skills and the reasons for this migration should be investigated.

Figure 10 - Science Graduates - occupation preferences[10] by degree level.



Source: HEA First destination of award recipients in higher education 1995, 1996, 1998 and 2000.

In contrast to the trend in science, the level of outward migration from engineering to other professions is minor for both the Primary and Higher Degree levels. The most preferred migratory option for engineering graduates at both the primary and higher degree level is into the environmental area. It could be argued that most skills required in the environment area are SET based. Hence, the level of

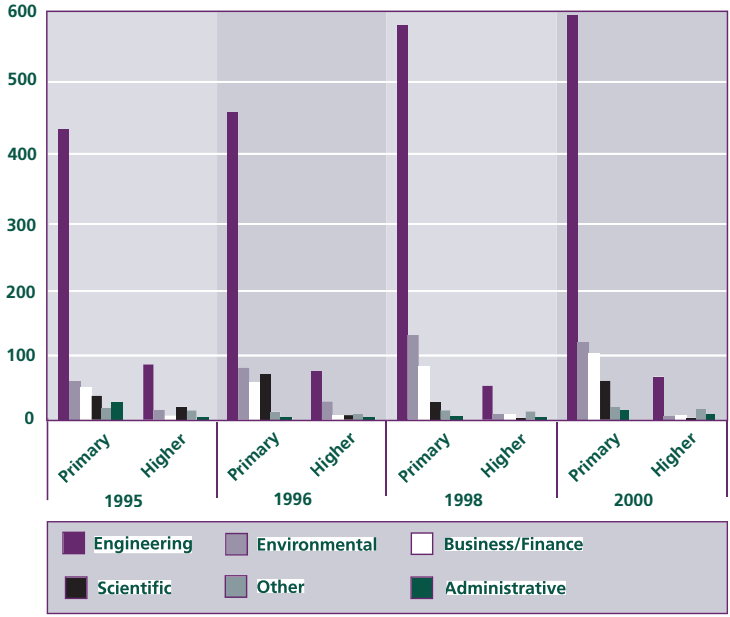
10 The occupation categories listed include the following professional activities:

1. *Scientific - Professional and technical support*
2. *Business/Financial - Financial work, management services, marketing advertising, public relations, sales-purchasing/selling*
3. *Engineering - professional and technician support*
4. *Other - teaching/lecturing, agriculture, forestry & fisheries, manual workers*
5. *Administrative - Administrative, Executive and General Managerial workers; Clerical and related work; Information, library and non-scientific research work.*
6. *Environmental - profesional and support in environmental planning.*

Source: HEA First destination of award recipients in higher education 1995, 1996, 1998 and 2000.

outward migration to non-SET professions is minimal and only a small number of engineering graduates, both at Primary or Higher Degree level, pursue a career outside the engineering discipline (Figure 11). In analysing the destination of engineering graduates, the types of engineering skills were not identified. Hence no distinction was made between civil / structural engineering, electronic / electrical engineering and biomedical related areas.

Figure 11 - Engineering graduates – occupation preferences[11] by degree level.



Source: HEA First destination of award recipients in higher education 1995, 1996, 1998 and 2000.

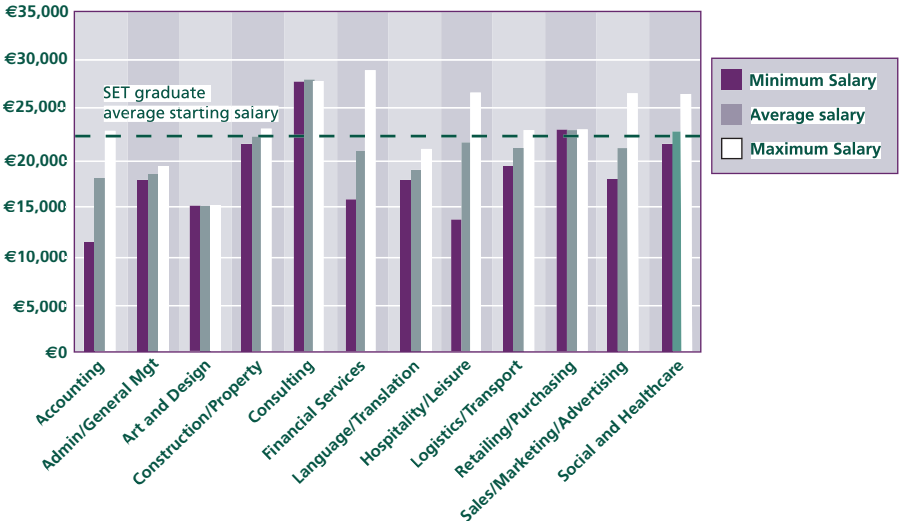
11 The occupation categories listed include the following profesional activities:

1. *Engineering - Professional and technician support*
2. *Environmental - professional and support in environmental planning*
3. *Business/Financial - Financial work, management services, marketing advertising, public relations, sales-purchasing/selling*
4. *Scientific - Professional and technician support*
5. *Other - Teaching/lecturing, agriculture, forestry & fisheries, manual workers*
6. *Administrative - Administrative, Executive and General Managerial workers; Clerical and related work; Information, library and non-scientific research work.*

Source: HEA First destination of award recipients in higher education 1995, 1996, 1998 and 2000.

The migration to non-SET dependant employment is largely evident at primary science degree level. No information is available on the ratio of certificate and diploma to degree qualifications that migrate to other professions. The average starting salaries for SET graduates are on average higher than a range of non-SET professions (Figures 9 and 12). Hence starting salary is not the only influencing factor causing migration from SET to non-SET professions. Anecdotal evidence suggests that career path options and future potential earnings and benefits are further contributory factors.

Figure 12 - Graduate Starting Salary Range, for a selection of non-SET professions employing SET graduates, Ireland 2001.



Source: Finfacts, Graduate Recruitment Salary Survey 2001.

The absence of a comprehensive national database on earnings profiles and career destinations and career paths for science and engineering graduates further militates against the development of a cohesive national policy for promoting the take-up and retention of science and engineering graduates in the SET dependant industries. The development of a cohesive national database would require the participation of the main stakeholders, including The Expert Group on Future Skills Needs (EGFSN), Higher Education Authority (HEA), Enterprise Ireland (EI), Science Foundation Ireland (SFI) and The Conference of Heads of Irish Universities (CHIU).

ICSTI recommends:

1. That the findings on the competitiveness of the postgraduate stipends and average starting salary for science and engineering graduates is proactively promoted by all stakeholders in line with the national endeavour to increase take-up and retention in the science and engineering subjects.
2. That the Higher Education Authority:
    i. take action to develop a database containing longitudinal information on Irish graduate destination, to include the current data capture on the destinations of graduates 9 months after graduation and to extend this data capture to include Irish graduate destination at fixed period thereafter, e.g. after 3 and 7 years;
    ii. in conjunction with other relevant agencies / bodies such as the Expert Group on Future Skills Needs, to conduct a feasibility study on the collection of such data, recognising that the current First Destinations Report would not be an efficient or effective method for such data collection.

Appendix 1

Tertiary graduates in EU Member States, by field of study and level of education (2000) (percentage of all subject categories).

	Engineering, manufacturing and construction	Agriculture	Life sciences	Physical sciences	Mathematicsl and statistics	Computing
Degree Level						
OECD mean	**13.2**	**2.3**	**3.1**	**3.0**	**1.1**	**3.1**
Austria	17.3	2.9	3.2	3.1	0.8	2.8
Belgium	12.5	3.5	6.3	2.0	0.6	1.0
Denmark	8.9	3.2	4.2	4.3	1.0	1.8
Finland	24.0	2.3	1.9	2.7	1.0	2.2
France	11.2	0.8	6.7	5.8	2.8	2.7
Germany	19.0	1.9	3.0	5.8	1.9	2.8
Ireland	9.3	1.7	6.9	3.3	1.1	8.4
Italy	16.0	2.1	3.0	1.8	2.8	0.9
Netherlands	10.4	2.3	1.1	1.9	0.3	1.5
Norway	6.8	1.4	1.2	1.4	0.3	3.3
Spain	12.9	3.0	2.5	3.3	1.4	2.9
Sweden	20.5	1.0	2.3	2.4	0.6	3.1
United Kingdom	9.9	1.1	6.0	5.0	1.3	4.2
Japan	*21.3*	*3.4*	*4.4*	*x(9)*	*x(9)*	*x(9)*
United States	*6.5*	*2.3*	*4.1*	*1.5*	*0.9*	*2.8*

	Engineering, manufacturing and construction	Agriculture	Life sciences	Physical sciences	Mathematicsl and statistics	Computing
Sub-Degree Level						
OECD Mean	**14.7**	**2.4**	**n**	**n**	**n**	**6.8**
Austria	33.9	5.6	n	1.4	0.3	0.6
Belgium	10.8	0.5	0.5	0.3	n	4.2
Denmark	12.4	1.1	n	n	n	2.7
Finland	19.5	1.5	a	a	a	4.0
France	25.2	n	1.8	2.4	0.4	3.3
Germany	13.7	3.4	a	n	a	0.3
Ireland	19.6	0.7	2.7	4.5	n	17.8
Italy	a	a	a	a	a	a
Netherlands	2.3	a	a	a	a	9.2
Norway	14.9	0.1	n	a	a	21.6
Spain	23.6	0.5	n	n	n	10.3
Sweden	23.3	7.1	0.1	0.1	0.2	20.5
United Kingdom	9.2	1.6	1.6	1.5	0.3	7.1
United States	*18.6*	*1.9*	*a*	*a*	*a*	*6.2*
Japan	*16.9*	*0.7*	*n*	*x(9)*	*x(9)*	*x(9)*

Source: Education at a glance.OECD Indicators 2002.

Appendix 2 - ICSTI Focus Group

ICSTI Focus Group on Salaries for Science and Engineering Graduates

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