

Management Science and Information Systems Studies

Final Year Project Report



***Academic Tenure: A Comparative Study Between Europe and North America***

*Ingrid Duggan April 2024*

**TRINITY COLLEGE DUBLIN**

**Management Science and Information Systems Studies Project Report**

# Academic Tenure: A Comparative Study Between Europe and North America

## April 2024

### Prepared by: Ingrid Duggan Supervisor: Paula Roberts

### Declaration

I declare that the work described in this dissertation has been carried out in full compliance with the ethical research requirements of the School of Computer Science and Statistics.

I have read and I understand the plagiarism provisions in the General Regulations of the University Calendar for the current year, found at: <http://www.tcd.ie/calendar>

I have also completed the Online Tutorial on avoiding plagiarism ‘Ready, Steady, Write’, located at <http://tcd-ie.libguides.com/plagiarism/ready-steady-write>

I declare that the report being submitted represents my own work and has not been taken from the work of others save where appropriately referenced in the body of the assignment.

Signed:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Full Name Date

The aim of this project was to conduct a study comparing the differences in the academic tenure track (TT) between Europe and North America. This was to be achieved by analysing a number of parameters relating to the tenure track and exploring the similarities and differences of these parameters between Europe and North America. The main output of the project was the development of a web based application, that allows an end user to explore the data. This web-app took the form of an interactive map, and was built and deployed using the Shiny package for R Studio.

This project was requested by the Trinity College Dublin branch of the Irish Federation of University Teachers (IFUT). IFUT is a trade union representing university staff from institutions across Ireland, and they campaign for their members on a number of issues like funding for higher education institutes, protecting academic freedom, and the treatment of university staff. In recent years, IFUT have become increasingly interested in the tenure track (TT) model that is quickly gaining popularity in Irish universities and many others across Europe.

The main goal of the project was to compare aspects of the TT between North America and Europe, in order to understand how this relatively novel concept for European universities is being implemented across different countries and how this compares to the established TT system in North America. IFUT wanted to understand how the TT system in Ireland and Europe is affecting academics, in order to ensure the fair treatment of these junior academics and to be able to lobby on behalf of their members on this issue. The two main outputs of this project were an extensive review of the relevant literature concerning the TT in North America, Europe, and Ireland, as well as an interactive dashboard that displays data relating to the TT through a number of different visualisations. The dashboard utilised the R Shiny library and was successfully deployed online through ShinyApps.io.

The research found a number of differences between the TT in North America and the TT in Europe, with tracks also differing between countries and even universities in the same country. Some of the differences found were the length of probationary periods, promotion procedures at the end of the track, ‘stop the clock’ procedures, and employment laws which prevent the TT from being implemented in some countries. A number of recommendations for universities are also included in the report.

I would like to thank my supervisor, Dr Paula Roberts, for her continued support and guidance throughout this project, and the time she took to consistently provide valuable feedback. I would also like to thank Dr Jason Wyse from IFUT and TCD’s School of Computer Science and Statistics for his direction and recommendations in the development of the dashboard and the project as a whole.

**IRISH FEDERATION OF UNIVERSITY TEACHERS - TRINITY COLLEGE DUBLIN**

**Academic Tenure: A Comparative Study Between Europe and North America**

***X April 2024***

#### TABLE OF CONTENTS

|  |  |  |
| --- | --- | --- |
| NO. | SECTION | PAGE |
| 1 | INTRODUCTION AND SUMMARY | 1 |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

#### INTRODUCTION AND SUMMARY

This chapter introduces the client and gives a brief overview of the project. It also lists the terms of reference of the project, and provides a summary of the remaining chapters.

##### The Client

IFUT-TCD is the Trinity College Dublin branch of the Irish Federation of University Teachers. IFUT represents university staff across the country, including lecturers, researchers, and librarians, and they lobby on behalf of their members on a wide range of issues. The union comprises a number of branches, inducing branches in TCD, DCU, UCD, Maynooth University, and the University of Galway. The IFUT-TCD representative for this project was Dr Jason Wyse from the School of Computer Science and Statistics.

**1.2 Project Background**

The academic tenure track (often abbreviated as TT) is a career path for junior academics, at the assistant professor level, to work their way up to a tenured (permanent) job position. The concept of TT has existed in North American universities for decades, however in recent years it’s becoming increasingly adopted by European universities in a push to attract international research talent. While the track has its advantages, mainly the opportunity to progress to a tenured position with job security and academic freedom, it also presents a number of challenges, particularly the high pressure it puts on academics to perform well in a number of areas, like research and teaching, over a short number of years.

As the TT is only in its early stages of implementation in Europe, few studies have been conducted analysing how the track is being established across different countries and institutions. This is made even more challenging due to the fact that aspects like employment law and university funding can be vastly different across individual countries. As a result, it has currently been difficult to paint an accurate picture of the current state of the tenure track in Europe. Therefore, IFUT-TCD are interested in investigating how the tenure track is being implemented across Irish and European universities in order to ensure the fair treatment of junior academics. They also want to understand the extent at which the TT is being implemented in a similar or different manner across institutions and countries, as well as how the landscape of the tenure track in Europe compares to the landscape in North America, which has a considerably longer history of the TT, and can therefore be a useful tool to measure Europe’s TT implementation against.

**1.3 Terms of Reference**

The terms of reference, as agreed with the client, are set out below:

* Conduct a literature review of the available academic articles exploring the TT process in Ireland, Europe and North America.
* Compile and analyse relevant parameters of data to compare and contrast the TT situation between Europe and North America, particularly focussing on the length of TT, as well as the requirements to obtain tenure.
* Display the data in an interactive web application that a user can use to explore the data, possibly in the form of a map where countries can be interacted with to obtain information about their tenure data.
* Make recommendations to IFUT that can be used in their representation of Irish university staff at a national level in relation to the TT process in Ireland.

**1.4 Summary of Remaining Chapters**

The remainder of the report consists of the following chapters:

* Chapter 2 discusses the key recommendations and conclusions of the report.
* Chapter 3 examines the background research conducted, focussing on the definition of tenure, the TT in North America, and the extent to which the TT has been implemented in a selection of European countries.
* Chapter 4 outlines the creation and design of the interactive web application using the Shiny package for R studio.
* Chapter 5 discusses the results seen from the quantitative data included in the web application, and how this contributes to the initial comparison of the TT in chapter 3.
* Chapter 6 contains a discussion on the findings of the project as a whole.
* Chapter 7 highlights the limitations of this project and any difficulties faced, as well as outlining areas of future work that could be explored.

#### RECOMMENDATIONS AND CONCLUSIONS

This chapter contains the conclusions drawn from the literature research and the dashboard data, as well as listing a number of recommendations to the client.

**2.1 Conclusions**

* While the TT is a long established system in North America, its novel status in Europe has resulted in a number of different implementations of the track across universities and countries. Some European countries have established TT systems which have been around since the mid 2000s, while others have only introduced the TT in recent years. A number of other countries don’t have any form of the TT due to issues like employment laws.
* A number of differences were found between the TT in North America and the TT in Europe. For example, while tenure and promotion both occur at the end of the TT in North America, promotion is not guaranteed in Europe, and often has to be applied for separately. North America also tended to have longer TT probationary periods than Europe, which is largely due to universities making the requirements for tenure stricter in recent years.
* The TT is exacerbating existing issues, like the lack of gender diversity in academia and temporary employment. In the case of gender diversity, the TT is often not an optimal system for increasing the number of women at the professorial level, given the difficulties that many women face when trying to stop the clock for maternity leave. In the case of temporary contracts, it was found that many of the TT positions in North America have been replaced by contingent contracts in recent years, and that the 5-6 year TT probationary period, on top of temporary positions for PhD fellows and postdocs, is prolonging temporary employment in academia.

**2.2 Recommendations**

* European universities should weigh up the consequences of implementing the TT, as it can be a source of extreme stress and uncertainty for staff. They should also ensure that aspects of the TT that face opposition in North America, like tenure quotas and lengthening probationary periods, are avoided in order to attract and retain staff.
* Universities that have implemented a TT system should explore options for shortening the lengthy probationary periods. This could be similar to the system adopted by some universities in the Netherlands, which replaced the TT with an 18 month temporary contract that leads to permanent employment upon successful completion. This would reduce the stress and uncertainty placed on staff, as well as promoting diversity as underrepresented staff may feel more comfortable taking a shorter risk of 1-2 years rather than the typical 5-6 year TT contract.
* Universities should ensure that TT systems do not widen the gap between the proportion of men and women in academia, particularly at higher rungs of the academic ladder. Certain policies and measures should be introduced to promote gender diversity on the TT and

beyond, including clear and easily accessible ‘stop the clock’ policies for both men and

women, and gender diverse decision making panels to help foster inclusive working environments.

* European universities should avoid replacing tenure-eligible positions with temporary contracts. Countries with particularly high proportions of temporary staff, like Germany, Finland and Austria, should focus on introducing more career paths that lead to tenure, in order to attract talented staff and reduce the stress and uncertainty that temporary contracts can bring.
* At a higher level, the European Union and national governments should promote and fund new career tracks that can attract talented staff to European universities. In doing so, they should keep the best interests and wellbeing of all staff on these tracks in mind by reducing some of the key areas of uncertainty and pressure for candidates, including unnecessarily long probationary periods, unclear ‘stop the clock’ procedures, and the tightening of the requirements for tenure.

#### BACKGROUND RESEARCH

This chapter contains a review of the relevant literature surrounding the TT, as well as an initial comparison of the tenure track between North America and Europe.

#### 3.1 Defining Tenure and the Tenure Track (TT)

The American Association of University Professors (AAUP) defines tenure as “an indefinite appointment terminable only for cause or under extraordinary circumstances, such as financial exigency,” (Tiede, 2022). The main principle underlying the concept of tenure is that it protects academic freedom. Academics with tenured positions are free to conduct research in areas of interest to them, without facing pressure to appease external stakeholders in fear of losing their position. Therefore, an advantage of tenure is that it protects the quality of research and teaching in universities, as academics aren’t suppressed in their work and are free to write and speak about topics that may be viewed as controversial (AAUP, n.d).

The academic tenure track (often abbreviated as TT) is formally defined by the League of European Research Universities (LERU) as “a fixed-term contract advertised with the perspective of a tenured position at a higher level, subject to positive evaluation and without renewed advertising of and application for the next position,” (LERU, 2014). As such, the tenure track is essentially a career path for junior academics to progress, after meeting the necessary criteria, to a tenured position later down the line.

According to the Welfare, Wealth and Work (WWW) for Europe project, an advantage of the tenure track model is that academics can reach a tenured position based purely on their own work and merit, rather than depending on an arbitrary job to open up at some point in the future (Janger et Al, 2013). Therefore, while the opportunity of a tenured position, granting job security and academic freedom, is the main draw for academics on the tenure track, like any system the tenure track has its downsides. Most notably, there is often a huge amount of pressure on TT candidates to perform highly in a number of different areas including research, teaching and publications. Since the track is usually only about 5 to 6 years in length on average, those on the track often avoid taking holiday leave or withhold plans to start a family in order to focus on their career progression. Furthermore, the TT is essentially a probationary period, meaning those on the track are not guaranteed to still have a job at the end of their time on the track, leading to uncertainty about the future and the fear of their hard work over a lengthy 5 to 6 year period failing to pay off.

#### 3.2 An Overview of TT in North America

Tenure and the tenure track are predominantly North American concepts, and were first formally defined by the American Association of University Professors (AAUP) in the

‘Statement of Principles on Academic Freedom and Tenure’ in 1940. The AAUP found that in 2022, 87% of around 1,400 bachelor’s, master’s, and doctoral institutions had a tenure system in place (Tiede, 2022).

However, despite its longstanding history, tenured positions have been steadily on the decline in North American universities for decades, and the percentage of tenured college professors in the US today is about 45.1%, compared to 65% in 1980 (Adetunji, 2021). The same is also true for Canada, which saw a drop of almost 10% in the percentage of professors with tenure, from 79.8% in 1989 to 70.3% in 2007 (Desjardins, 2015). One reason for this decline was the Covid-19 pandemic, which saw universities terminating tenured staff on the grounds of financial issues, despite the fact that a number of these institutions never officially declared financial exigency. This led to criticism from the AAUP who claimed that institutions were taking advantage of the pandemic to lay-off more expensive tenured staff (AAUP, 2021). In the AAUP’s 2022 Survey of Tenure Practices, 53.5% of institutions had replaced at least one tenure line with a contingent appointment in the last five years, where contingent faculty refers to those appointed off the tenure track. This stands in stark contrast with the 17.2% figure from 2004, showing the huge move away from tenure tracks over the last 20 years (Tiede, 2022).

The same survey also investigated the number of universities with a “tenure quota”, which refers to a limit placed on the number of faculty who can hold a tenured position at a given time. The percentage of institutions with a tenure quota has actually decreased from 17.8% in 1988 to 8.6% in 2022. The reason for this decline is likely a result of the huge opposition to tenure quotas from organizations like the AAUP, who argue that the quotas essentially “nullify probation” due to the fact that staff on the tenure track probation period, who meet the requirements for tenure, won’t be granted tenure if it means the overall quota would be exceeded.

It’s worth noting that in the aforementioned 1940 Statement, tenure was originally intended to be granted automatically to faculty who were reappointed after the seventh year (Tiede, 2023). These foundations were essentially uprooted when Harvard’s ‘up or out’ tenure track system, introduced in 1939 (Daniel, 2022), started to become the standard system of many US universities. In the ‘up or out’ system, tenure is only granted upon appointment to a specific rank, which typically occurs after a positive review at the end of the tenure track (Reichman, 2023). If the tenure candidate has not progressed to this rank at the end of the track, they must leave the institution. In the AAUP’s Winter 2023 report “*What’s Happening to Tenure?”,* a call is made for a “new deal” for tenure that “embraces the provisions of the 1940 Statement,” highlighting the pressure that academics are putting on universities to put an end to the longstanding “up or out” tenure track system (Tiede, 2023).

One aspect of the TT system that has only become standard in the last twenty years is the concept of “stopping the tenure clock”, which is when a TT candidate can apply for a temporary pausing of the TT, thereby increasing the probationary period, for cases of maternity

leave, long-term sickness, or other reasons. In 2001, the AAUP recommended that institutions allow faculty to “stop the tenure clock for up to one year for each child, with a maximum of two times” (Tiede, 2022). In 2022, 80% of US institutions allowed faculty members to stop the tenure clock, which was a huge increase from the figure of 17% in 2002 (Bauer-Wolf, 2022). However, while more institutions are now permitting the tenure clock to be stopped, the system is not without its flaws. A 2021 paper by Fox and Gaughan found that even though stopping the tenure clock had no impact on whether an individual was awarded tenure, it was discovered that faculty who did temporarily stop the tenure clock faced disadvantages *after* tenure had been attained (Fox and Gaughan, 2021). The findings of the paper attributed this to a potential caregiving bias, whereby those who stopped the clock for caregiving duties, but were still awarded tenure, faced issues later down the career path in the promotion to full

professor. Since women are more likely than men to stop the tenure clock, these findings highlighted a disproportionate impact of these biases on women, leading to gender disparities at higher academic career levels in the United States.

#### 3.3 An Overview of TT in Europe

While the TT is a well established and commonplace system in North American universities, it has only started to gain traction in Europe during recent years. In LERU’s 2014

report on ‘Tenure and Tenure Track at LERU Universities,’ it’s stated that the TT is being increasingly adopted by European institutions in an attempt to “attract promising researchers and offer them attractive careers.” The report discusses that most universities that have implemented the TT have used an “up-or-out” system, but stresses that no European

university had implemented a direct equivalent to the North American TT system at the time of publication. Because every European country has differences in employment laws as well as different frameworks for career progression in higher education institutions, there are very few “blanket statements” that can be made about the tenure track in Europe when comparing it to that of North America. Furthermore, due to the time and space constraints of this project, only a subset of countries that were felt to give a well rounded view of the TT situation in Europe were researched and are discussed below.

No Tenure Track Implementation

While the tenure track is gaining popularity across Europe, there are some countries in which a TT implementation is complicated due to the legal framework that institutions are bound by, namely the United Kingdom, France and Spain.

***The United Kingdom***

In the UK, prior to 1988, the concept of tenure did exist. Academics in permanent positions could not be made redundant, and could only lose their jobs for reasons of “good cause” like gross misconduct (Otsuka, 2019). The Education Reform Act of 1988 essentially eliminated

this tenure, which meant that academics could now be dismissed on the same grounds as employees in any other profession. The academic career model in the UK is often referred to as a “probation on the job” model, due to the two or three year probationary period that can lead to a permanent position at the same level, if the candidate meets a certain set of criteria (Frølich et al, 2018). This is different to the North American tenure track system, which offers a permanent position at a higher level. Even though there is no exact replica of the North American TT system in the UK, some universities have introduced tenure-track style systems in recent years. For example, the ‘250 Great Minds Initiative’ at the University of Leeds, which launched in 2014, recruited “250 early career researchers onto a career development program” which led to permanent professor positions provided a set of criteria was met (Else, 2015). However, it appears that the fellowship was a temporary recruitment drive, as it was labeled as ‘discontinued’ in a 2020 job posting from the Early Career Researchers Centre (ECR Central, 2020).

***France***

In France, the majority of higher education institutions are publicly owned and therefore most

of the permanent faculty at these institutions are civil servants who are tenured. Postdocs can apply for a *Maître de Conférences* position*,* which is typically equivalent to an assistant or associate professor position (LERU, 2014), and can become tenured staff after a short one to two year probationary period. When staff become tenured, they can then benefit from the

*Statut général de la fonction publique* (public employment statute), which grants them continuous employment, while also setting out their rights and regulating their salaries and

pensions (Chevaillier, 2021). Short term contracts that will not lead to a tenured position are uncommon, and are typically only used to fill a vacant tenured position for a temporary period.

Therefore, in French universities there does not exist, and likely never will exist due to the employment laws, a direct comparison to the North American tenure track.

***Spain***

In Spain, there are three fixed-term programs that post-doctorates can apply for to begin their careers. The *Ramón y Cajal* facilitates entry into an academic career, the *Juan de la Cierva* is for research careers, and the *Torres Quevedo* is for those looking for careers in the private sector (LERU, 2014). Focussing on the *Ramón y Cajal*, the program offers five year fixed term contracts to post doctorates with promising research work and international professional experience. According to the Severo Ochoa research center in Madrid, the path was initially designed to “attract national and international talent to the Spanish system of Science and Technology, similar to [the] "Tenure track" established in other countries,” (CBMSO, n.d). After the five year period, a performance evaluation is conducted, with the possibility of the candidate receiving a permanent position upon a positive evaluation. The permanent position has the title of *Professor Titular de Universidad*, and is equivalent to the level of associate professor, with about 40% of Spanish academics having this title (Academic Positions, 2018).

However, even though the *Ramón y Cajal* program is often likened to a TT program, and is even titled as a TT position in some job descriptions like [this](https://www.disva.univpm.it/sites/www.disva.univpm.it/files/disva/job%20and%20opportunities/RyC%20position%20Oceanic%20Geosciences.pdf) one from the University of

Salamanca, LERU disputes that it meets the qualifications to be a TT system. Their argument stems from the number of obstacles that still stand in the way of a candidate receiving a permanent position even when a positive evaluation has been received after five years. For example, “all academic stages in Spain are subject to state-approved accreditation” (LERU, 2014), which means that the National Accreditation Board must still approve a candidate’s journal publications, research, and teaching work before a permanent position is awarded (Max Planck Institute, n.d). Another obstacle is the unguaranteed availability of permanent positions, as these positions can only be created by the government if appropriate funding is available. Finally, if a permanent position is available, it’s still open to competition from anyone with the required qualifications, and not only to *Ramon y Cajal* candidates (LERU, 2014).

National and local governments still hold a lot of power over the university system in Spain, for example in the creation of positions and the accreditation of staff, however recent years have proved more promising for Spanish academics. For example, 2023’s *new Organic Law of the University System* brought a number of positive effects for university staff, most notably the re-defining of the associate professor position from a temporary position to a permanent one (European Commission, 2023).

Early Tenure Track Implementation

There are a number of European countries who have started to offer TT contracts in some of their universities over the last ten years, in particular Ireland.

***Ireland***

In recent years, there appears to be a trend of Irish universities adopting aspects of the North American education system. For example, a number of Irish universities, including Trinity College Dublin, University College Dublin, and the University of Galway, have moved towards

the US classification system for academic titles. This involves pivoting from the traditionally used UK titles of “lecturer” and “senior lecturer”, to the US titles of “professor”, “assistant professor,” and “associate professor” (University College Cork, 2022). The move towards the North American TT system is therefore almost to be expected, and despite being in its early stages as a career path in Ireland, the TT has notably been adopted by two major Irish

universities: Trinity College Dublin (TCD) and the University of Limerick.

Looking at TCD, the TT for new academic staff was approved in 2016, and is defined by the university as: “an initial five-year contract, with a view to permanency, subject to performance,” (TCD, 2019). There are extensive criteria for promotion on completion of the TT, with specific objectives in areas like research and scholarship, teaching, and contribution to the college being taken into account. For example,TT candidates in STEM disciplines must have four

high-quality peer reviewed publications, in which they were a first or senior/corresponding author in at least two of them, as well as needing to obtain external grant funding, have an extensive teaching portfolio, have student evaluations, and engage in wider public life, among

other criteria (TCD, 2020). One of the most notable aspects of this TT is the fact that, unlike the US model where “promotion and tenure are folded into a single life-changing event” (Albright, 2023), the TT at TCD involves “no commitment to appointment or promotion to a level above the recruitment level of assistant professor,” (O’Connor, 2023).

A study conducted in 2022 by Pat O’Connor from the University of Limerick involved the surveying of academics who had completed Trinity’s TT process, and a number of interesting results, particularly on the issue of gender disparity, were found. Firstly, female TT appointees made up only 26% of the 40 Ussher II assistant professors appointed since 2016 (O’Connor, 2023), in which the Ussher professorships were a part of the college’s Global Recruitment

Campaign in their 2014-2019 Strategic Action Plan (TCD, 2015). It was also found that

stopping the tenure clock for reasons of maternity leave, paternity leave or illness made no

difference to the attainment of tenure, which is consistent with the previously discussed findings from the United States. However, the women surveyed in this study who took maternity leave during the TT still faced a number of issues, including a lack of clarity

surrounding how maternity leave would be taken into account and the consequences of taking maternity leave. A male respondent also commented on the “weighty” process of applying for paternity leave that left him to instead take two weeks of holiday leave. The caregiver bias theory, proposed in the aforementioned Fox and Gaughan paper, may be a cause of the underrepresentation of women at higher career levels in Trinity, with the figure of almost half (49%) of assistant professors being women falling to just 33% of full professors being women (O’Connor, 2023). However, this is a nationwide, and in fact global, issue, and it should be noted that Trinity’s rate of change since 2012 of increasing the proportion of women at professorial level has been faster than at any other Irish university, rising from 12% in 2012 to 31% in 2019 (Taggart, 2021).

While there is less available information surrounding the TT process at the University of Limerick, it shares a myriad of similarities with Trinity’s TT system. The track at UL is also five years in length, with the criteria for a permanent contract including: “excellent scholarship and

research output, excellent teaching and curriculum development, and satisfactory service to

the university and the wider community” (University of Limerick, 2023). In terms of gender diversity at the professorial level, UL has been consistently above the national average, with the percentage of female professors standing at 31% in 2017 compared to the average of 21% across Irish universities (UL, 2017).

Established Tenure Track Implementation

There are a number of European countries who have been offering TT appointments in their universities for a number of years, often beginning in the early to mid 2000s when the TT

began to gain traction as a career path in Europe. Some of these countries include the Netherlands, Finland, and Italy.

***The Netherlands***

Like many other European countries, the TT implementation in the Netherlands varies between regions, universities, and even between faculties within universities. Many Dutch universities, particularly science faculties and universities of technology, adopted the TT model in the early 2000s as a way to attract and retain talented researchers (Van de Meent, 2023). In general, similarly to what was previously mentioned about Ireland, the Dutch TT differs from that of North America as the decision to receive tenure and the decision to be promoted to associate professor do not occur at the same time (Lantsoght, 2023).

Interestingly, the Faculty of Science at VU Amsterdam discontinued their TT system in 2022. The program was terminated after only four years, with the university’s Tenure Track Evaluation working group concluding that the track’s biggest issue for faculty was “the uncertainty and stress caused by the long-term temporary appointment,” (Benda, 2022). The TT system was replaced with a new career track that involves a temporary contract, up to a maximum time of 18 months, and assumes a permanent position after this time period. There is also a go-no-go decision at 15 months or earlier, where the candidate is either chosen to continue or exit the career path. One of the often-mentioned advantages of the TT, which was disputed by the aforementioned working group, is that the track eliminates complicated dismissal procedures if candidates do not meet the criteria for a permanent position. The working group argued that since most people at the university received a tenured position

anyway “this advantage [did] not outweigh the stress experienced by tenure trackers,”

(Benda, 2022). Andrea Baldi, a physicist at VU Amsterdam, also stated that the new career path would promote diversity in the university, as candidates from underrepresented backgrounds would feel more comfortable taking the smaller 15 month risk than the lengthy 5 year TT risk. He also mentioned that job insecurity was a huge factor in the underrepresentation of female STEM faculty in academia.

However, VU Amsterdam Faculty of Science’s decision to discontinue their TT system is only one of a plethora of Dutch universities making the same pivot away from the TT. The Faculty of Science at Utrecht University replaced their TT with a career development trajectory track, which converts to permanent employment after 18 months. The 65 members of faculty who were on the TT prior to this change all received permanent contracts on 1st April 2023 (Van de Meent, 2023). The same 18 month career path was also implemented at TU Delft, with all 432

TT candidates being able to transfer to the new career trajectory path. However, it’s still

important to note that these permanent positions, as previously mentioned, are not promotions

to a higher position. The move from assistant to associate professor still often takes a number of years. At TU Delft, for example, it can take up to a maximum of eight years to be promoted to associate professor.

***Finland***

Finland has long faced the problem of a shortage of job vacancies for young academics, which is the result of a number of reasons, including a high number of aging academic staff in

tenured positions, and a reluctance of Finns to pursue job opportunities overseas. According to Tapani Kaakkuriniemi, a former president of the Finnish Union of University Researchers and Teachers (FUURT), the problem is exacerbated by the oversupply of doctorate holders, with around 1,700 doctors successfully defending their dissertation every year (Else, 2015).

In 2010, Finnish universities became independent legal entities due to a higher education policy change in the University Act of 2009, which meant that university staff were no longer civil servants, and universities had greater autonomy over their structure (LERU, 2014). This change led to the implementation of the TT system in all of Finland’s 13 major universities. The new University Act also helped to facilitate Finnish institutions in the acquisition of third-party external funding, which was often used to create more TT positions in an attempt to attract talented researchers. One interesting point about the TT in Finland is that, according to the Finnish Union of University Professors: “recruitment shall concern all levels of tenure track equally, the level of full professor included,” (FUUP, 2021). This means that candidates on the Finnish TT system not only have the opportunity to progress to a *higher* position, but can also eventually progress to the *highest* position of full professor. For example, post-doctoral candidates at the University of Helsinki begin the TT on an assistant professor contract of three to five years, after which a mid-term evaluation is carried out. If the evaluation is positive, a new associate professor contract of three to five years is given, which concludes with a final evaluation of the member of faculty. A positive outcome in the final evaluation finally leads to a full professorship. LERU summarises the TT system at the University of Helsinki as “a two-tier tenure-track model of six to ten years’ duration,” (LERU, 2014). Interestingly, this structure is not unique to Finland, and has some similarities to the German and Swiss tenure systems. For example, at universities like LMU Munich, the University of Zurich, and The Université de Genève, it’s possible to reach the status of full professor at the end of the track if certain criteria are met (LERU, 2014).

***Italy***

The Italian equivalent of an assistant professor is the *Ricercatore* (Researcher) position. Prior to 2010, this position was a permanent civil servant position, however new legislation introduced in 2010 means that the position is no longer permanent (LERU, 2014), and is now divided into two different paths: Type A and Type B. *Ricercatore* type A positions are three

years in length, but can be extended for two further years, and do not require postdoc

experience. This position is not part of the TT, but it’s common to start on the Type A contract and then apply for a Type B contract, which is part of the TT (Academic Positions, 2018). *Ricercatore* type B positions are also three years in length, but cannot be extended, and finish with a final evaluation that can lead to promotion to the *Professore Associato* position. In many

universities, like the University of Milan, the number of associate positions available to

*Ricercatore* type B researchers has to be decided within the first two years of the contract, meaning that researchers face an “up or out” decision at the end of their contract (LERU,

2014). Associate professor positions in Italy are either tenured or TT positions, and can eventually lead to full professorships, with the title of *Professore Ordinario*.

**4 System Overview**

This chapter provides an overview of the creation of the interactive dashboard that was requested by the client to display data relating to the TT. It contains the objectives of the dashboard, a discussion on the architecture of a Shiny web application, an overview of the dashboard, and a description of the design decisions that went into making the dashboard.

**4.1 Purpose and Objectives of the System**

In consultation with the client, it was decided to develop an interactive web application which could be used to visualise and explore the TT data. As per the client’s preferences, the main component of the dashboard took the form of a world map, by which data relating to the TT in different countries can be investigated.

The following is a list of the objectives and requirements of the system as agreed with the client:

* Ensure that the system can be used to explore a number of different areas relating to the TT, including the length of the TT process, TT contracts, and gendered TT statistics.
* The system should ideally feature a map as one method of displaying the data.
* The system should be user friendly with a clear interface allowing for easy navigation.
* The system should be deployed in a suitable way so that it can continue to be used by the client after the completion of this project.

**4.2 Technical Environment**

The R Shiny package was chosen for the development of the dashboard, due to its extensive framework that facilitates the creation of robust and fully customisable interactive dashboards ([Storożenko](https://appsilon.com/author/pasza/), 2023). Shiny is also well documented, with numerous supports and resources available online, and its integration with R allows for the use of an extensive number of statistical methods, functions, and visualisations.

R Shiny

Shiny is a package for R, the popular statistical programming language with over two million users (RConsortium, n.d), that allows the creation of interactive web applications. The Shiny package has also recently become available for Python, however R was chosen due to its longer establishment with the Shiny package, resulting in increased functionality and a larger breadth of documentation online ([Radečić](https://appsilon.com/author/dario/), 2022). The architecture of a Shiny application contains three main components: a user interface (UI) object, a server function, and a call to the shinyApp function. The UI object is responsible for the actual design and appearance of the application that will be visible to the user, while the server function contains the server-side

logic which updates the dashboard based on the user input. Finally, the shinyApp function combines the UI and server components together and builds the Shiny app (Shiny, 2017). Shiny also allows the use of HTML, CSS, and JavaScript in order to create highly customised dashboards.

ShinyApps.IO

The dashboard was successfully deployed online through ShinyApps.IO, as requested by the

client, and there are a number of advantages to using this method of deployment for Shiny applications. Firstly, it’s straightforward and efficient as applications can be published straight from RStudio and deployed into the cloud within minutes, without the need for firewalls or additional hardware. It’s also secure, as Shiny apps operate within their own protected environment and user access is always SSL (Secure Sockets Layer) encrypted (Posit, 2022). Finally, this method of deployment provides a number of metrics about the application, including the number of connections to the app and its memory usage, which can be easily accessed from within the ShinyApps.IO account dashboard. There are a number of subscription plans available with varying features, however the free account was chosen for this purpose as only one application was required to be deployed.

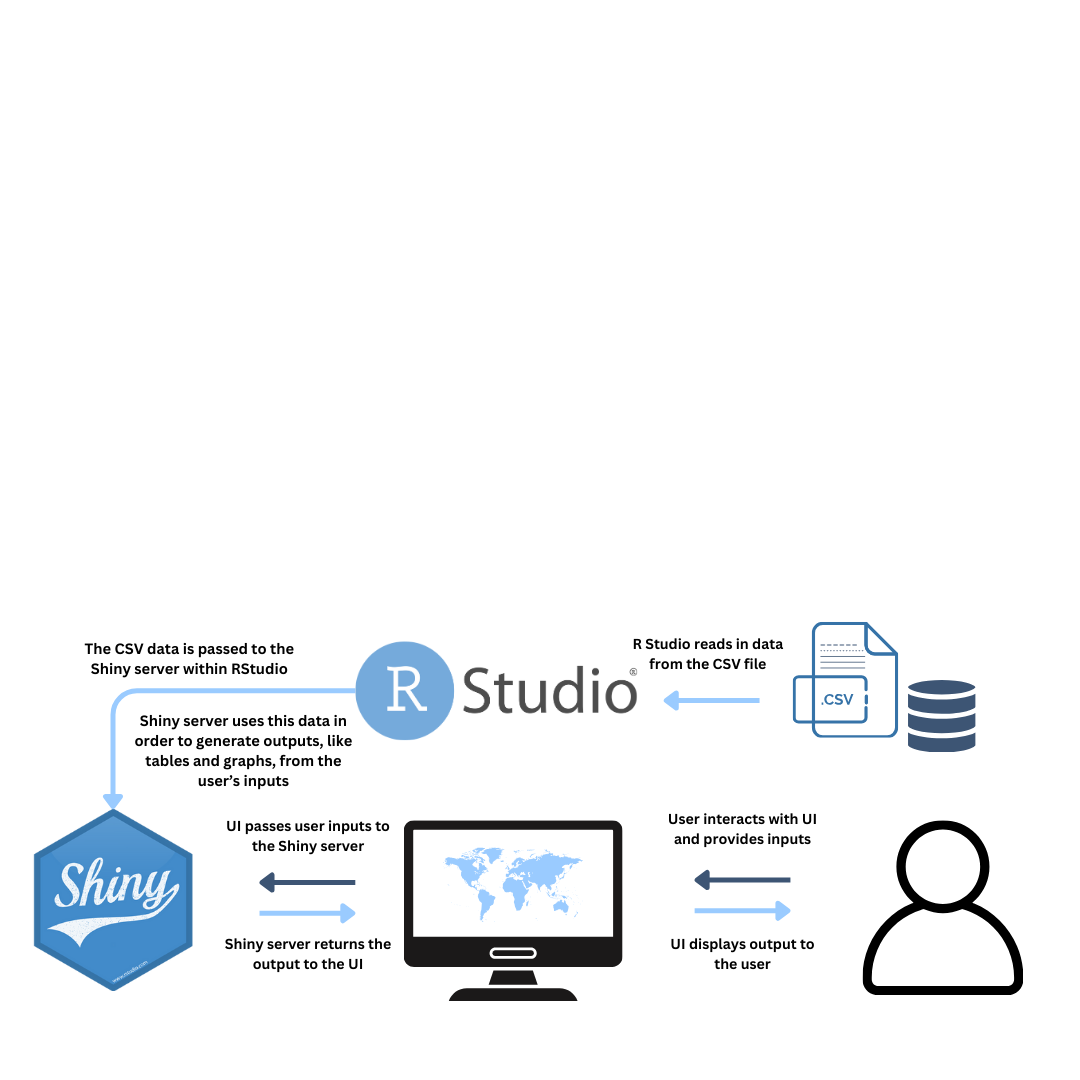
System Overview Diagram

FIGURE 4.2.1 – System Overview Diagram.

The system overview diagram in Figure 4.2.1 describes how the Shiny application works, and how the frontend and backend are connected. The frontend consists of the user and the user interface (UI), which the user interacts with by providing inputs, for example selecting the type of data they want to view. The UI then passes these inputs to the Shiny server in the backend of the application, which operates within R Studio. On the initial loading of the application, R Studio reads in the academic TT data from the CSV file database, which the Shiny server then

uses to generate outputs from the user’s inputs, for example a map displaying the user’s selected data. Finally, these outputs are passed back to the frontend of the application for the UI to display them to the user.

**4.3 System Description**

As outlined in Section 4.1, one of the core objectives of the dashboard is to enable a user to explore a range of different datasets relating to the academic TT. The foundation of the

application is therefore a database of CSV files, where each file contains data relating to an aspect of the TT. These files are read by R Studio and turned into dataframes, which are then used in the Shiny server to create outputs like tables, graphs, and the world map. The ‘data set’ menu (shown at point A in Figure 4.3.1 below) allows the user to explore the data in the different CSV files, with the three options being “Length of Tenure Track”, “Gender Statistics”, and “Contract Type”. The descriptions and outputs of each data set are shown below:

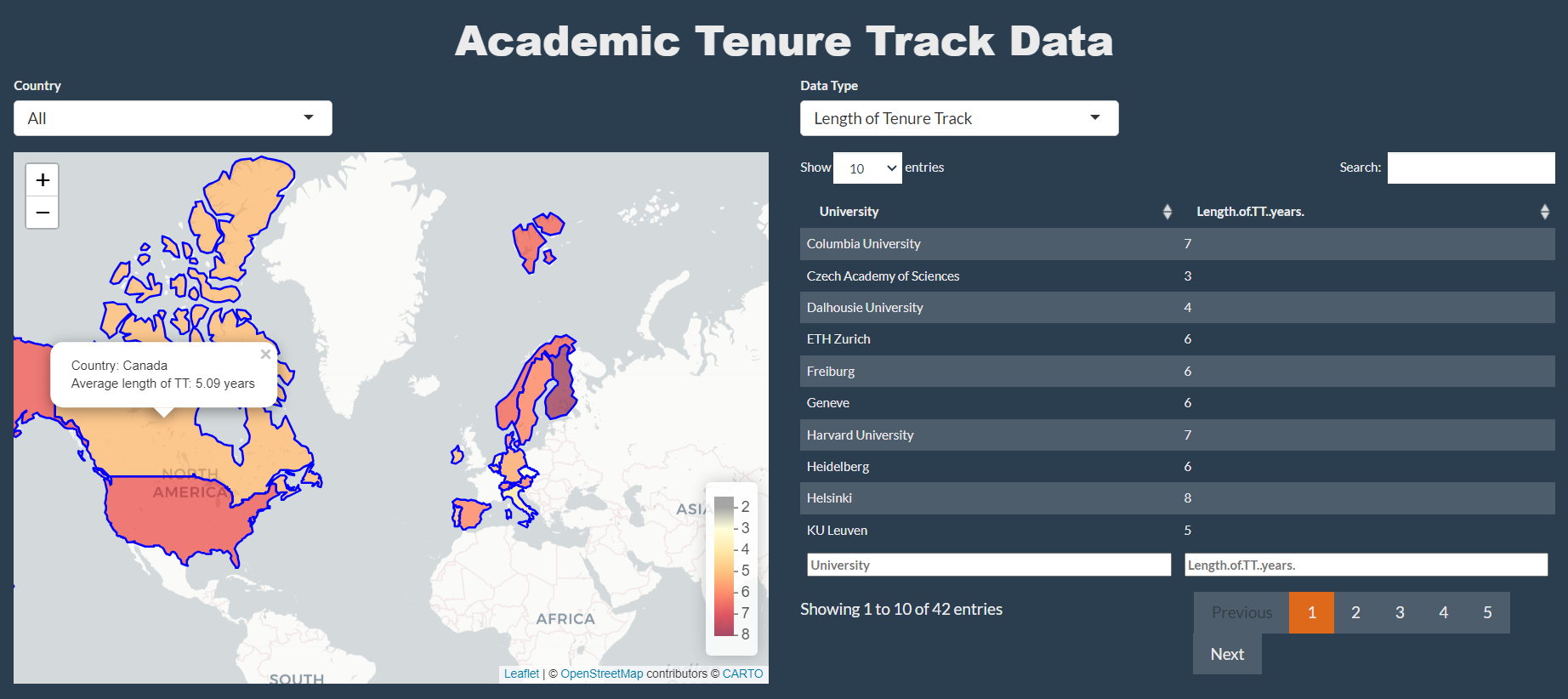
Length of Tenure Track Data

FIGURE 4.3.1 – View of the ‘Length of Tenure Track’ dataset.

The figure above shows the UI output if the user selects the ‘Length of Tenure Track’ dataset, which contains information about the length of the TT in different universities across North America and Europe. The map colours the countries according to the average length of the TT for universities in each country, by using the colorNumeric function in R to map these numbers to a colour palette, with the key of the colour scale shown on the side of the map. The average length of the TT for a given country can also be found by clicking on that country to display a popup box, as shown for Canada above. By default, all countries in the dataset are shown on the map, however this can be filtered to individual countries using the ‘Country’ dropdown list on the left hand side. This will result in only a single country being displayed on the map, as

well as only the universities within that country be shown in the table on the right hand side of the dashboard.

Due to the huge number of universities in these countries with TTs, especially in the United States where roughly 1200 institutions have a tenure system in place (Tiede, 2022), and the time constraints of the project, only a select number of universities from each country were chosen. For the United States, one in eight faculty members that are trained in the US attended just five universities: Stanford University, the University of California Berkeley, Harvard University, the University of Wisconsin-Madison, and the University of Michigan (Wapman et al, 2022). These five institutions were included in the dashboard data, as well as a number of other leading institutions, in order to paint the best picture of the United States’ TT situation using only a small sample of universities. In Canada, there are 223 public and private universities (CMEC, n.d), so a small subset of institutions with the TT system were also selected. In Europe, most of the major universities with TTs were included in the dashboard however, as per the project description, there are significantly fewer European universities with the TT than in North America.

Another consideration that had to be made when compiling the data for this section of the dashboard was the variation in the length of time that academics took to complete the TT in these different universities. Most universities listed their tenure track length as a maximum number of years which could not be exceeded (with the exception of candidates who needed to stop the tenure clock and extend the length of the track). In these situations, the maximum length, without stopping the clock, was taken. In other cases, a range of years was given for the length of the tenure track (for example 6-10 years for the University of Helsinki), and in these cases the average length in the range was taken (in this case 8 years).

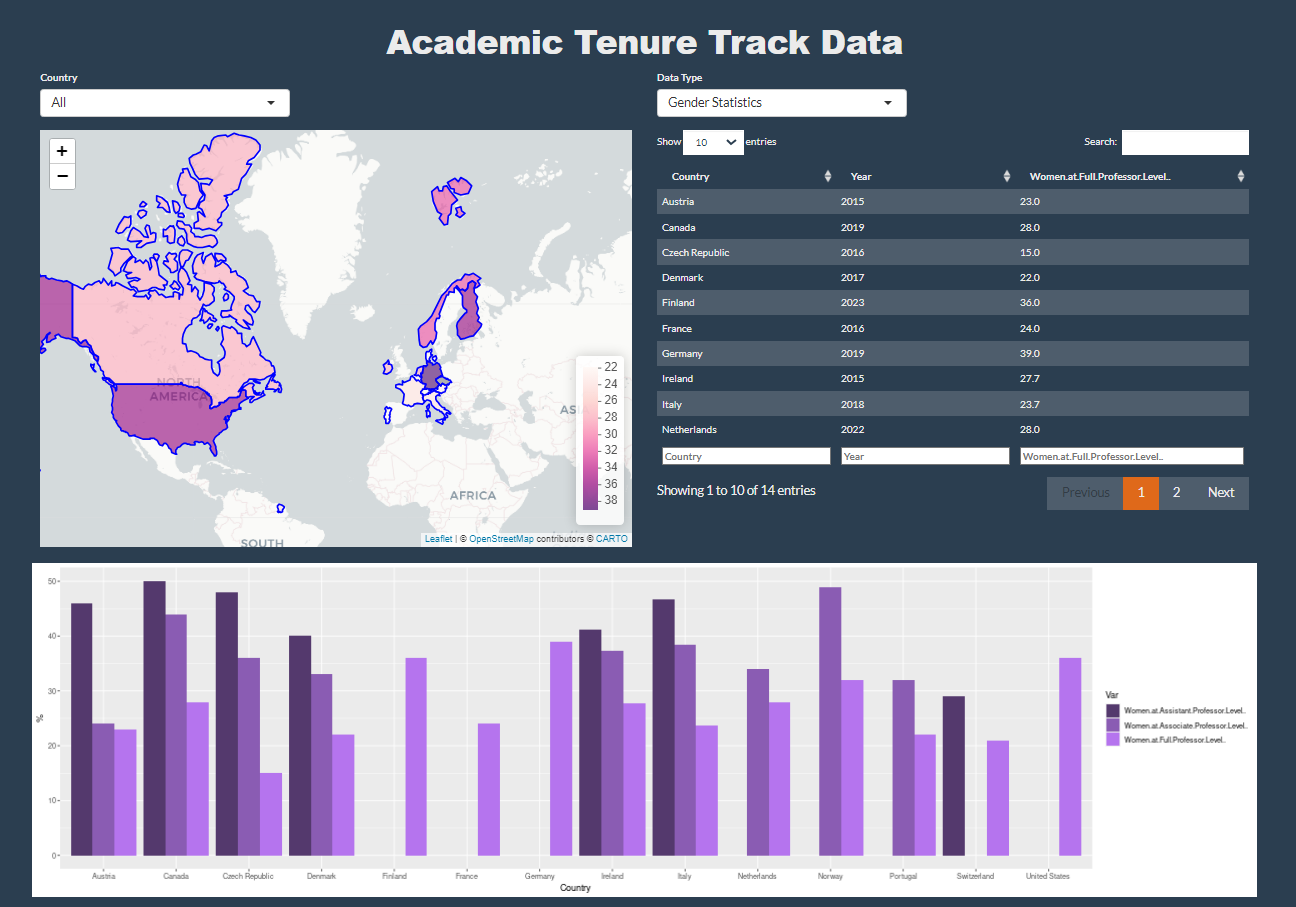
Gender Statistics

FIGURE 4.3.2 – View of the ‘Gender Statistics’ dataset.

The above figure shows the dashboard UI output if the user selects the ‘Gender Statistics’ option from the Data Type menu. This dataset includes the percentage of full professors that are women for a number of countries, and this data is shown on the map as well as in the table. Furthermore, there is also data relating to the percentage of assistant professors and the percentage of associate professors that are women, which are included on the barchart, along with the full professor statistic, at the bottom of the screen. For this dataset, the years for which the different statistics were collected are also shown in the table, which is because the statistics were not taken for the same year for every country. Furthermore, not every one of the

three chosen statistics were available for every country, which can be seen by the gaps on the barchart, most notably for Finland and France. However, the ‘percentage of full professors who are women’ statistic is available for all of the given countries.

Contract Type Data

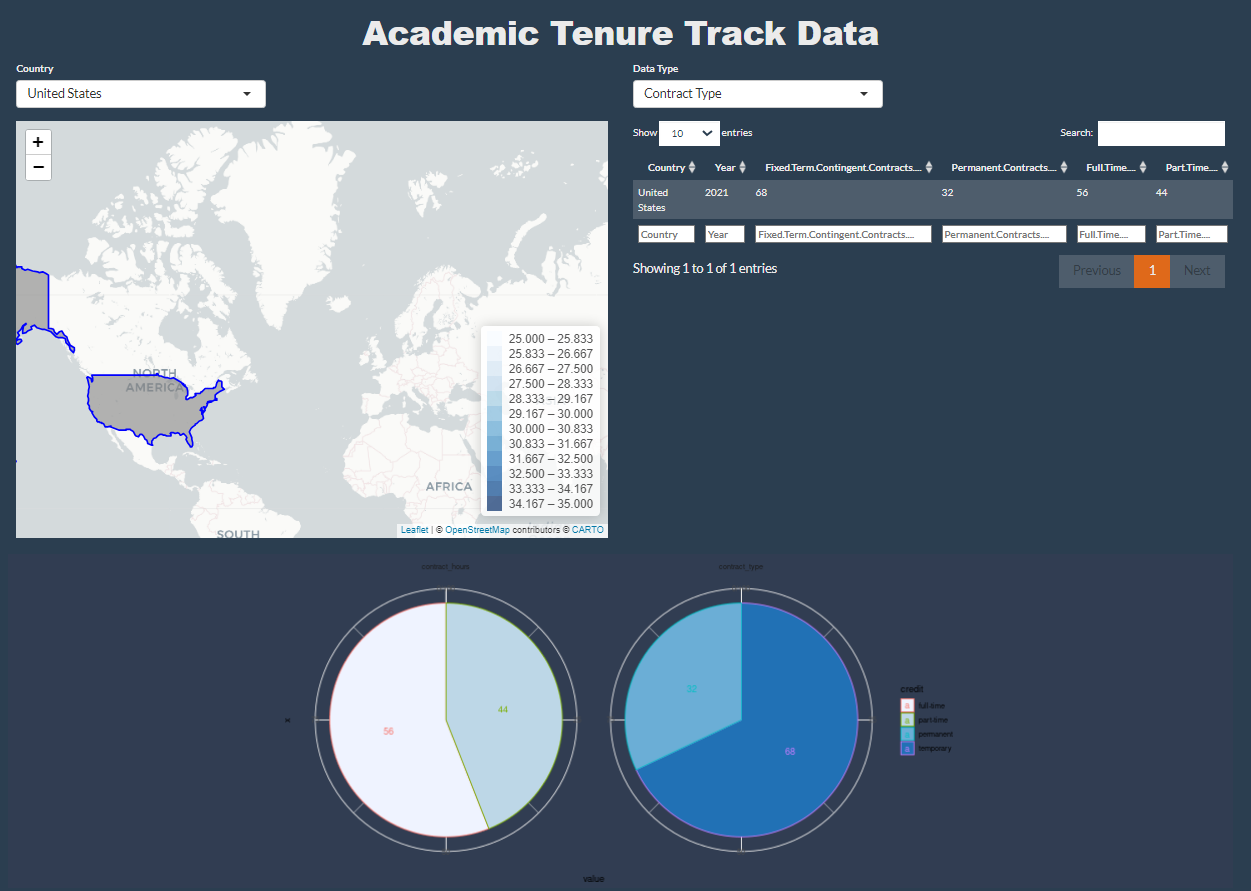


FIGURE 4.3.3 – View of the ‘Contract Type’ dataset.

The above figure shows the dashboard UI output if the user selects the ‘Contract Type’ option from the Data Type menu. This dataset includes the percentage of academic staff that are on temporary contracts, which is displayed on the map, alongside the percentage on permanent contracts and the percentages of full-time and part-time staff at universities in the selected countries. The pie chart on the left-hand side shows ‘contract\_hours’ which compares the percentage of staff in full-time versus part-time positions, meanwhile the pie chart on the right-hand side shows ‘contract\_type’ which compares the percentage of permanent versus temporary contracts that academic staff in these countries are on.

**4.4 System Design**

A number of design decisions were made during the development of the dashboard in order to make it intuitive for the user to navigate, as well as easy to understand and aesthetically pleasing to look at.

Data Visualisations

The types of data visualisations used in this dashboard include an interactive map, bar chart, pie charts, and tables. The design choices behind these methods of visualisation are discussed below.

The maps can be viewed as the core method of data visualisation used in the dashboard, and were suggested by the client at the beginning of the project. They were created using the leaflet package for R, which is an open source JavaScript library that is used to create interactive maps with features like custom map tiles, markers, pop-ups, and legends (Hahn, 2020). To build the map, the “world” dataframe from the ggplot2 map\_data library was loaded and inner-joined with the data from the three CSV files. Leaflet was then used to plot the relevant countries and their corresponding data onto the map, along with a colour palette, legend, and popups. Default latitude, longitude, and zoom values were also provided in order for the user to have the best view of all the relevant countries upon the loading of the dashboard. Maps were an ideal choice for the dashboard due to the country-focussed nature of the data in this project

Bar charts were used for the ‘Gender Statistics’ dataset, as seen in Figure 4.3.2, to display the percentages of assistant, associate, and full professors that are female. They were created using the geom\_bar function in the ggplot library. When all countries are selected, the barchart is a grouped bar chart that displays the three aforementioned statistics for each country in the dataset, where the countries are sorted in alphabetical order. As previously mentioned in section 4.3, not all countries had the three statistics readily available, so some gaps are present in the barchart. A grouped bar chart was chosen to display the data across different countries as this method of data visualisation allows meaningful and clear comparisons to be drawn across categories in a dataset, even if the dataset is large or complex (ChartExpo, n.d). Grouped bar charts also provide a complete view of what’s happening in a dataset, including trends, similarities, and outliers.

Pie charts were used for the ‘Contract Type’ dataset, as seen in Figure 4.3.3, to compare the percentages of full time and part time contracts, as well as to compare the percentages of permanent and temporary contracts. These pie charts were made using the geom\_bar function combined with the coord\_polar function in the ggplot library. The pie charts are visible when an individual country is selected from the ‘Country’ dropdown list, allowing comparisons of the data for specific countries to be drawn. Pie charts were chosen to display the ‘Contract

Type’ dataset as the data is in the form of percentages that add up to a whole. These types of charts represent data in a simple format and are intuitive for humans to understand. A paper by Ian Spence and Stephan Lewandowsky, published in 1991, found that pie charts outperformed bar charts for displaying proportional data, and summarised that a pie chart is “a useful tool for the display of proportions, especially when the observer is required to make comparisons involving combinations of components,’ (Spence and Lewandowsky, 1991). The specific percentages are also labeled on the pie charts, allowing the user to actual data underlying the pie chart.

Tables were used across the three datasets to display the data in the CSV files that are underlying the dashboard. The tables order the countries, or the universities in the case of the ‘Length of TT’ dataset, in alphabetical order, allowing the user to easily search for the data they are looking for. The tables are often used to display data that does not appear in the other visualisations on the dashboard, providing the user with more detail regarding the datasets. For example, the year that the data corresponds to for each country is shown on the ‘Gender Data’ and ‘Contract Type’ tables. Meanwhile, for the ‘Length of TT’ dataset, the table provides

an in-depth view of the length of the TT in specific universities for a country, which

supplements the main data of the average length of the TT in different countries, which is displayed on the map.

Colour

There are a number of ways that colour is used across the dashboard. Firstly, the main theme of the dashboard consists of dark navy and grey colours, as opposed to the default white background colour. While light coloured dashboards and websites have their appeal and are widely used across the internet, a darker theme was chosen for this dashboard for a number of reasons. Firstly, it provides a nice contrast to the map, which is composed of light colours, and helps make the different data visualisations stand out more. Dark coloured web applications also reduce eye strain, and have been found to be a better choice for graphic-heavy interfaces, while lighter colours are better for content-heavy interfaces (Miarka, 2019).

Colour is also used in the dashboard’s data visualisations. The maps for the three datasets each have their own unique colour scheme in order to differentiate clearly between the datasets. The RColorBrewer library was used to create unique colour numeric palettes for the different datasets, which map each data value to a colour, allowing them to be displayed as a gradient on the map visualisations. The map for the ‘Length of TT’ dataset is coloured using the yellow/red colour palette, which mimics a temperature gradient and clearly shows the increasing TT lengths across countries using darkening oranges and reds. The maps for the ‘Gender Data’ and ‘Contract Type’ datasets are coloured using the same method, with a pink/purple palette and a blue palette used respectively. The barcharts and pie charts in these

two datasets are coloured similarly to the maps, in order to provide consistency within the

visualisations for a specific dataset. For the bar charts specifically, a recommendation from the Canadian Statistics Office to “order the shade pattern from darkest to lightest” was used (Statistics Canada, 2021). This helped to show the contrast between the assistant and associate professor positions, which had the highest proportions of women and were coloured darker purple, compared to the full professor position, which consistently had the lowest proportion of women and was coloured the lightest purple on the bar charts.

Error Handling

Since the extent of the user interaction with the dashboard involves the user simply selecting what data they want to see from the dropdown lists, there is little room for errors to occur in the dashboard. The only case where an error could occur is if the user selects a country that isn’t in their chosen dataset, for example there is no data for the Czech Republic in the ‘Contract Type’ dataset. To handle this error, the Shiny server checks if the filtered data returns a dataframe with more than zero rows. It does this by performing a validation check using the validate() and need() functions, and prints the error message “No data available with current filters” if the data frame does not have more than zero rows. Shiny’s default errors are difficult to understand and are printed using urgent red coloured text, so doing the error handling described above helps make it easier for the user to understand what went wrong (Cheng, 2017).

**5 Comparative Analysis**

This chapter contains an analysis of the data on the dashboard, paying particular attention to comparing the three datasets between North America and Europe in order to better understand the differences in the TT situation between the two regions.

**5.1 Dashboard Dataset Comparison**

Contract Type Data

Focussing on the map data, which shows the percentage of academic staff on contingent or temporary contracts, it’s immediately noticeable that the data is extremely varied across countries. Looking at North America, 25% of Canadian academics were on temporary contracts in 2014, according to the Canadian Association of University Teachers’ *Almanac*, which was a relatively unchanging figure over the period of 1998-2014 (CAUT, 2015). This is compared to the figure of 68% of American academics that were on temporary contracts in 2021, which the AAUP reported as an increase from 47% in 1987 (AAUP, 2023). This is a stark difference between the two countries and highlights the over-reliance on temporary contracts in American universities. In relation to the TT, 53.5% of US institutions reported replacing tenured positions with temporary positions between 2017 and 2022 (Tiede, 2022). In 1969, 78% of academic staff at US institutions were on the TT, which stands in stark contrast to the 25% figure for 2018 (Gitonga, 2021). A similar trend is true for Canada, which saw only 19% of PhD holders having tenured or TT jobs in 2021 (Peters, 2021).

In Europe, there are also noticeable differences between countries. The country with the highest percentage was Germany, with 80% of academics on fixed term, temporary contracts. LERU comments that “a prominent feature of the German system is the relatively low percentage of professorships among full-time academic staff,” which leads to a high proportion of academics below the professorial level being on temporary contracts (LERU, 2014). Austria had the second highest percentage of temporary contracts, at 75%, with Frølich et al (2018) attributing this figure to “a rise in the use of part-time lecturers, employed on fixed-term contracts to teach one/two/three classes per semester.” The same paper also reported a high (70%) proportion of temporary contracts in Finland. The rest of the countries had less than 50% of workers on contingent contracts, ranging from 45% in the Netherlands to 18% in Norway.

It’s also important to note that these numbers can vary widely between different universities within a country, as well as between seniority levels. For example, in the Netherlands, 90% of assistant professors at Utrecht University were on temporary contracts in 2020, compared to 30% in Eindhoven (HOP, 2020). At the associate professor level there’s also variation, from up to 60% on temporary contracts in Tilberg to almost none in Delft. In general, for most

countries, the higher up the career ladder one goes, the proportion of academic staff that are employed on temporary contracts decreases (Frølich et al, 2018).

Given the high number of fixed-term contracts in North America and the fact that many universities in the US and Canada have recently moved away from the TT in favour of temporary employment, it’s unlikely that a widespread introduction of the TT system in Europe would decrease the dependency that universities have on temporary workers. In fact, Frølich et al argued that the TT could actually worsen the problem, stating that “the introduction of a tenure track system on top of temporary positions as PhD fellow and postdoc might in fact prolong the period of temporary employment.”

Gender Statistics Data

The map data shows the percentage of full professors that are women across a number of different countries. Looking at North America, it’s clear that the US and Canada are among the countries with the highest proportion of female professors, with 36% and 28% respectively. In terms of the TT, 44% of TT faculty in the US were women (AAUW, n.d) compared to almost half (49%) in Canada (Statistics Canada, 2022). According to the American Association of University Women (AAUW) “many key [advancement opportunities](https://www.jstor.org/stable/10.1086/678475?seq=1#page_scan_tab_contents) in [higher education professions](https://www.amazon.com/Professor-Mommy-Finding-Work-Family-Academia/dp/1442208597/) often coincide with women’s childbearing years” which limits not only the number of women seeking these opportunities, but also the consideration of women for these positions as a result of the caregiving bias mentioned in *Section 3.2.* Interestingly, 70% of tenured male professors have children compared to just 44% of tenured female professors (AAUW, n.d), highlighting that being a parent likely isn’t the leading cause of this bias but rather the uniquely female issues of pregnancy and maternity leave.

In Europe, the countries with the highest proportions of female professors were Germany (39%), Finland (36%), and Norway (32%). Looking at the University of Helsinki, which publicly releases the gender breakdown of its TT, 51% of assistant and associate professors were women, compared to just 36% of full professors (University of Helsinki, n.d). Recalling that this is a two tiered track, as mentioned in *Section 3.3,* the TT doesn’t seem to be successful at converting the gender parity at the lower academic ranks into full professorships. Looking at the countries in the middle of the ranking, Ireland, the UK, and the Netherlands all had similar proportions of female professors in the range of 27-28%. Looking at Ireland, which saw the proportion of 41.2% of female assistant professors fall to just 27.7% of full professors, Pat O’Connor, when speaking about the TT, commented “why is priority being given to changing structures at the initial stage, where gender balance exists, than at the (full) professoriate level where it does not exist?” (O’Connor, 2015).

On the lower end of the scale, there doesn’t appear to be much differentiation between countries with a TT and countries without a TT in terms of gender diversity at the full professor level. Non TT countries like France and Spain, with proportions of 24% and 15% respectively,

were ranked similarly to TT countries like Italy, Austria, and Czechia, with proportions of

23.7%, 23% and 15%. This highlights that the TT alone is likely not an advisable way to improve gender equality at higher academic positions, with countries that do have higher gender diversity at these levels, like Scandinavian countries, having a number of other policies in place to promote gender equality in academia, like gender-balanced decision making bodies and inclusive career paths (NordForsk, 2024). In any case, no country on the dashboard came close to achieving gender parity at the full professor level, highlighting the work that needs to be put in by universities to remove the barriers that women face in their progression up the academic career ladder.

Length of TT Data

Looking at the data in North America, the average TT length of the ten Canadian universities included on the dashboard was 5.09 years. This is similar to the national average, reported by the Canadian Statistics Office in 2021, of 5.5 years. It’s worth noting that the average time to tenure in 1990 was only 4.6 years, showing an increase of almost a year to receive tenure over the thirty year period (Statistics Canada, 2021). It was also found that women took three and a half more months than men to get tenure in Canada. In the United States, the ten universities included on the dashboard had an average TT length of 6.7 years. The AAUP recommends that the tenure review should happen no later than six years into the probationary period, and the average length across the US does remain at around six years (Flaherty, 2022), however it can take up to seven years in some Ivy League universities, including Princeton, Harvard, and Columbia.

In Europe, there’s naturally more variation in the data. The longest TT length is the University of Helsinki at 8 years, and initially appears to be an outlier in the data. This figure was found by averaging the 6-10 year range that the track can take to complete, however, as mentioned in Section 3.3, this TT is a two tier track comprising a 3-5 year assistant professor track and a 3-5 year associate track. Therefore, if just the assistant track is taken into account, the average length is only 4 years. The shortest TTs of 18 months are in the Netherlands, at VU Amsterdam, TU Delft, and Utrecht. These were previously discussed in *Section 3.3* as a move away from traditional TTs in order to lessen the stress and uncertainty that 5-6 year probationary periods can cause to faculty members. The average of all the European university TTs that were included on the dashboard is 4.94 years, which is about a year lower than the average of the North American universities, which was 5.86 years. However, with the aforementioned rise in the time to get tenure from 4.6 years to 5.5 years in Canada, it’s not impossible that some European universities might follow the same path in the coming years.

**6 Discussion**

Taking a step back and looking at the bigger picture, it’s clear that while there are obvious advantages of tenure for academics, including job security and academic freedom, there are no clear benefits of the TT system itself for candidates. While the TT is advantageous for universities because it can attract talented staff with the opportunity of a tenured position later down the line, as well the fact that it provides easier dismissal in the case of poor performance, the track puts stress and uncertainty on staff due to the heavy workloads, long probationary periods, and unclear outcomes which make planning for the future difficult. It’s also surprising that European universities have been moving towards the TT system given that many North American universities are actually moving away from the system towards temporary contracts, and are making tenure as a whole more difficult to get, through longer probationary periods and stricter tenure requirements. Aspects of the TT have also faced opposition from North American unions like the AAUP, for example tenure quotas, lengthy probationary periods, and difficulties faced in the ‘stop the clock’ procedure. Another interesting finding was that in North America, upon the successful completion of the TT, the candidate receives tenure *and* a promotion to a higher rank. However, many of the European universities that have introduced the TT don’t guarantee a promotion to a higher position at the end of the track. Therefore, it’s difficult to see why European universities are pivoting towards the career track if it’s likely to face opposition from staff, and it could be strongly argued that universities that are introducing the TT are doing so without the best interests of their staff in mind.

One of the findings of LERU’s study on the TTs in Europe was that “all completed tenure tracks at LERU universities have received a positive evaluation, and all candidates have been granted a professorship,” (LERU, 2014). This finding highlights that European TT candidates are screened to a high standard at the preliminary appointment level, and suggests that the long probationary periods, which place stress and uncertainty on staff, are redundant if all TT candidates receive tenure in the end. This is similar to the argument in favor of VU Amsterdam’s move away from the TT, which said that since the majority of people on the track received tenure at the end, the advantages of the TT that arose for the university in the case of poor performing staff, like an easier dismissal process, were not outweighed by the stress that was put on candidates. Thus, it would be more beneficial for staff if European universities put less focus on the introduction of TTs in an attempt to emulate the North American system, and instead focussed on improving their appointment procedures and shortening the probationary periods, for example to 18 months like at a number of Dutch universities.

Overall, the TT has clearly been a contentious system for years in North America, and risks facing the same levels of opposition in Europe if it’s not introduced with caution. In any case, universities that are in the early stages of TT implementation, or are considering the introduction of a TT, should bear in mind the consequences that this may have for their staff, and should ensure that policies are in place to provide a smooth transition to this relatively new career track in Europe.

**7 Limitations and Future Work**

Overall, there were a few limitations to this project, which gives scope for further research on this area in the future. These limitations included:

Most notably, there was a lack of information surrounding the TT implementation across universities in Europe. There are a number of articles from the early 2010s when the track started to gain popularity, however there has been very little research conducted in recent years. LERU’s 2014 article T*enure and Tenure Track at LERU Universities* was used extensively for this project as it contained a comprehensive overview of the TT situation in Europe, however it was outdated in some respects. For example, it doesn’t discuss the TT in universities that joined LERU after 2014, like Trinity College Dublin which joined in 2017 (TCD, n.d), as well as not taking into account the move away from the TT that some European universities have recently been doing over the last couple of years. LERU were contacted for information about whether or not there was more recent research conducted on the subject of the TT but confirmed that this 2014 paper is the most recent publication available.

However, LERU did state that there had been recent internal discussions from some groups, like the Careers and Equality, Diversity, and Inclusion groups, about potential policies practices for the TT, given that there is now over a decade of knowledge and experience gained since the last publication. Furthermore, the European Commission’s ‘European Research Era (ERA) Policy 2022-2024’ included the TT in its fourth action as a potential “transparent career development path” to “promote attractive and sustainable research careers” across the ERA (European Commission, 2022). Therefore, there is clearly a current interest in the topic at both national and European levels, highlighting a wide scope for further research on

* time/space constraints meant only a few universities, parameters etc were explored
* only publicly available info for unis was included

**TRINITY COLLEGE DUBLIN**

**Management Science and Information Systems Studies Project Report**

# Academic Tenure: A Comparative Study Between Europe and North America

## Appendices

**A ORIGINAL PROJECT OUTLINE**

# Project: Academic Tenure Track: A Comparative Study between North America and Europe

**Client:**  IFUT-TCD

**School contact:** Paula Roberts

**Client Background**

The Irish Federation of University Teachers (IFUT) is a trade union representing university staff across Ireland. We represent many grades across our branches including Lecturers, Researchers, Tutors, Librarians and other grades.

IFUT is the only trade union in Ireland which exclusively organises workers in our Universities. This unique position enables IFUT to not only represent our members on individual issues and through collective bargaining, but also to lobby and campaign for issues of concern to our members including protecting academic freedom, campaigning for greater investment in Higher Education and for respect and recognition for the importance of the work of our members not only to the students and universities themselves, but to our wider and global communities.

The union originated among a group of teachers at Maynooth College, now Maynooth University. In 1965, they formed the IFUT, and held its first general meeting in 1966. It is a Federation of branches, each with their own rules who are supported by the IFUT Head Office team, led by General Secretary, Frank Jones. IFUT now has branches in UCC, UCD, Trinity College, DCU, Maynooth University, NUI Galway, Mary Immaculate College Limerick, the Education Research Centre, and the RCSI.

**Project Background and Requirement**

Academic Tenure Track (TT) is an academic appointment for Assistant Professor that should lead to obtaining a tenure/’permanent’ position. It is predominantly a North American concept that has in recent years been adopted by European universities. Although the adoption of TT in European universities is more prevalent, it is difficult to know how the TT appointment is being implemented in Europe and to what extent it is being implemented in a similar or different manner in different countries. Understanding the landscape of TT in the European and Irish context is paramount to understanding how junior academics are being treated and what is required from them to obtain tenure in different jurisdictions/institutions.

The objective of this project is to complete a comparative study where the status of academic tenure track (TT) in North America and Europe is researched, analysed and presented. The work should look at aspects such as employment law, requirements placed on candidates to obtain TT, length of TT process etc. Where possible it would be good to explore any possible parameter in relation to TT for instance, TT positions advertised (by countries; universities etc.) Vs permanent (or other contractual employment) etc.

The project will have two parts:

* Research that will identify relevant parameters that can draw a picture of the TT situation in North America Vs Europe
* Displaying the data in an interactive manner and allowing the end user to ‘manipulate’/’query’/explore the data

**What is involved for the student?**

This project requires students to have research and analytical skills. A certain degree of technical/programming skills is also required as the data found should be display in a ‘dynamic’ web-based application that end users can interacted with to ‘query’ the data and obtained graphical information.

**B INTERIM PROJECT REPORT**

**Project:** Academic Tenure Track: A Comparative Study between North America and Europe

**Client:** Jason Wyse for the Irish Federation of University Teachers (IFUT) TCD Branch

**Student:** Ingrid Duggan

**Supervisor:** Paula Roberts

**Review of Project Background**

The academic Tenure Track (TT) is a fixed employment contract for Assistant Professor that may lead to the obtaining of tenure/permanent employment. It is a well established employment path in North America, but has recently been adopted by a number of European universities. As the trade union for Irish university staff, IFUT are interested in what the increased adoption of TT in Europe will mean for junior academics in Irish universities. The client is keen to draw comparisons between the situation of TT in North America and Europe, and it’s of particular importance to understand how TT is being implemented across European universities, including the length of TT, as well as the requirements needed to obtain tenure.

**Terms of Reference**

*The client has specified that the work conducted on this project should focus on:*

* A literature review of the available academic articles exploring the tenure track process in Ireland, Europe and North America.
* Compiling and analysing relevant parameters of data to compare and contrast the TT situation between Europe and North America, particularly focussing on the length of TT, as well as the requirements to obtain tenure.
* Displaying the data in an interactive web application that a user can use to explore the data, possibly in the form of a map where countries can be interacted with to obtain information about their tenure data.
* Making recommendations to IFUT that can be used in their representation of Irish university staff at a national level in relation to the TT process in Ireland.

**Work to Date**

*To date, I have:*

* Had meetings with both my supervisor and the client in order to gain a better understanding of the project, as well as the client’s requirements and expectations.
* Carried out initial research into the concept of academic tenure and the tenure track.
* Gathered a range of relevant journal articles exploring the state of TT in Ireland, North America and a number of European countries, particularly those in the League of European Research Universities (LERU).
* Compiled a spreadsheet containing data, found in the above journal articles, that explores a number of relevant areas including the length of TT and the promotion of tenure by gender.
* Explored a number of options for creating interactive web-apps for R and Python, including Shiny and Dash.

**Timeline of Further Work**

*Remainder of Michaelmas Term (1st - 17th December):*

* Continue my research of the topic by reading relevant literature and gathering data.
* Identify the key parameters of data that will be used in the comparison of TT between North America and Europe.

*Christmas Break (18th December - 21st January):*

* Select the relevant data and research the best statistical methods to use for analysing the data
* Conduct a detailed analysis of the data using R or Python, creating any required models and visualisations
* Draw any relevant conclusions based on this initial analysis and begin writing the report.

*Teaching weeks 1-4 (22nd January - 18th February)*

* Select the data to be included in the interactive web application.
* Create the web application using Shiny or Dash.
* Have a number of meetings with my supervisor and client, providing updates on the work completed to date.

*Teaching weeks 5-9 (19th February - 24th March)*

* Complete and test the web application, ensuring the interface is aesthetic and intuitive.
* Conduct extensive work on the report, including recommendations for the client, and ensuring a full draft is completed by the end of the period.

*Teaching weeks 10 and 11 (25th March - 7th April)*

* Submit a draft of the report to my supervisor and client for final review and recommendations, and make the necessary modifications to the report.
* Submit the completed report before the Monday of week 12 (8th April).

**Interim Conclusions**

Through meeting with my supervisor and client, I have been able to narrow down the specifications of the project and identify the terms of reference. My initial research into the tenure track process has yielded a number of relevant journal articles containing data that I aim to analyse in the coming weeks of the project. I hope that my literature review and analysis of the data, including the creation of a web application, will help in the comparison of the TT situation between North America and Europe.

**REFERENCES**

Report Literature

AAUP. (No date). *Tenure*. American Association of University Professors. [Online]. Available at: <https://www.aaup.org/issues/tenure> [Accessed: 24th January 2024].

AAUP. (2021). *Covid-19 and Academic Governance.* [Online]. Available at: <https://www.aaup.org/report/covid-19-and-academic-governance> [Accessed: 5th February 2024]

AAUP. (2023). *Data Snapshot: Tenure and Contingency in US Higher Education.* [Online]. Available at: <https://www.aaup.org/article/data-snapshot-tenure-and-contingency-us-higher-education> [Accessed: 25th February 2024]

American Association of University Women (AAUW). (No date). *Fast Facts: Women Working in Academia.* [Online]. Available at: <https://www.aauw.org/resources/article/fast-facts-academia/> [Accessed: 29th March 2024]

Academic Positions. (2018). *Italian Academic Job Titles.* [Online]. Available at: <https://academicpositions.com/career-advice/italian-academic-job-titles> [Accessed: 18th March 2024]

Academic Positions. (2018). *Spanish Academic Job Titles.* [Online]. Available at: <https://academicpositions.com/career-advice/academic-job-titles-in-spain> [Accessed: 18th March 2024]

Adetunji, J. (2021). *Academic Tenure: What is it and Why does it Matter?.* [Online]. Available at: <https://theconversation.com/academic-tenure-what-it-is-and-why-it-matters-162325> [Accessed: 5th February 2024]

Albright, J. (2023). *Below the Bar: Highlighting Inequities in Irish Academic Pay.* [Online]. Available at: <https://d1gi.medium.com/below-the-bar-highlighting-inequities-in-irish-academic-pay-6d7b7d69609b> [Accessed: 24th February 2024]

Bauer-Wolf, J. (2022). *Most colleges permit faculty to ‘stop the clock’ on tenure, survey finds.* [Online]. Available at: <https://www.highereddive.com/news/most-colleges-permit-faculty-to-stop-the-clock-on-tenure-survey-finds/623911/> [Accessed: 24th February 2024]

Benda, B. (2022). *Faculty of Science gets rid of Controversial Tenure Track.* [Online]. Available at: <https://advalvas.vu.nl/en/campus-culture/faculty-science-gets-rid-controversial-tenure-track/> [Accessed: 17th March 2024].

Canadian Association of University Teachers (CAUT). (2015). *CAUT* *Almanac of Post-Secondary Education in Canada: 2014/2015.* [Online]. Available at: <https://www.caut.ca/docs/default-source/almanac/almanac-2014-2015.pdf?sfvrsn=8> [Accessed: 21st March 2024]

Chart Expo. (No date). *Clustered Bar Chart.* [Online]. Available at: <https://chartexpo.com/charts/clustered-bar-chart#:~:text=Even%20if%20your%20dataset%20is,what's%20happening%20in%20your%20data>. [Accessed: 17th March 2024]

Cheng, J. (2017). *Write error messages for your UI with validate.* [Online]. Available at: <https://shiny.posit.co/r/articles/improve/validation/> [Accessed: 17th March 2024]

Chevaillier, T. (2021). *French Academics : Between the Professions and the Civil Service.* [Online]. Available at: <https://hal.science/hal-03210058/document> [Accessed: 10th February 2024]

Council of Ministers of Education, Canada. (No date). *Post Secondary Education.* Available at: <https://www.cmec.ca/299/Education_in_Canada__An_Overview.html#:~:text=Canada%20has%20223%20public%20and,213%20public%20colleges%20and%20institutes>. [Accessed: 11th March 2024]

Daniel, J. (2022). *The Cruelty of Faculty Churn.* The Chronicle of Higher Education. [Online]. Available at: <https://www.chronicle.com/article/the-churn?emailConfirmed=true&supportSignUp=true&supportForgotPassword=true&email=duggan.ingrid%40gmail.com&success=true&code=success&bc_nonce=v4gi29sepbm4l54be15> [Accessed: 18th February 2024]

Desjardins, L. (2015). *Profile and Labour Market Outcomes of Doctoral Graduates from Ontario Universities.* [Online]. Available at: <https://www150.statcan.gc.ca/n1/pub/81-595-m/81-595-m2012098-eng.htm> [Accessed: 5th February 2024]

Early Career Researchers Central. (2020). *250 Great Minds Fellowships by University of Leeds.* [Online]. Available at: <https://ecrcentral.org/fundings/250-great-minds-fellowships> [Accessed: 12th February 2024]

Else, H. (2015). *How to give the next generation of scholars a career boost.’* Times Higher Education. [Online]. Available at: <https://www.timeshighereducation.com/features/how-to-give-the-next-generation-of-scholars-a-career-boost/2017878.article> [Accessed: 12th February 2024]

European Commission. (2023). *Spain: new legislation affecting the university system.* Available at: <https://eurydice.eacea.ec.europa.eu/news/spain-new-legislation-affecting-university-system> [Accessed: 18th March 2024]

European Commission. (2022). *Template for Explanatory Documents on ERA Actions from the Era Policy Agenda.* [Online]. Available at: <https://era.gv.at/public/documents/4588/04_-_Promote_attractive_research_careers_explanatory_document_revised.pdf> [Accessed: 7th April 2024]

Finnish Union of University Professors (FUUP). (2021). *Professors Fair Tenure Track.* Available at: <https://www.professoriliitto.fi/en/work/tenure-track/> [Accessed: 18th March 2024]

Flaherty, C. (2022). *Tracking the evolution (and erosion) of tenure.* [Online]. Available at: <https://www.insidehighered.com/news/2022/05/18/tracking-evolution-and-erosion-tenure> [Accessed: 29th March 2024]

Fox, M. and Gaughan, M. (2021). *Gender, Family and Caregiving Leave, and Advancement in Academic Science: Effects across the Life Course.* Sustainability. [Online]. Available at: <https://www.mdpi.com/2071-1050/13/12/6820> [Accessed: 24th February 2024]

Frølich, N. et al. (2018). *Academic Career Structures in Europe. Perspectives from Norway, Denmark, Sweden, Finland, the Netherlands, Austria and the UK.* Nordic Institute for Studies

in Innovation, Research and Education (NIFU). [Online]. Available at: <https://www.khrono.no/files/2018/02/28/NIFUreport2018-4.pdf> [Accessed: 11th February 2024]

Hahn, N. (2020). *Making Maps in R: leaflet.* [Online]. Available at: <https://bookdown.org/nicohahn/making_maps_with_r5/docs/leaflet.html> [Accessed: 12th March 2024]

## Hoger Onderwijs Persbureau (HOP). (2020). Temporary contracts: large differences between universities. [Online]. Available at: <https://www.cursor.tue.nl/en/news/2020/februari/week-1/temporary-contracts-large-differences-between-universities/> [Accessed: 22nd March 2024]

Janger, J. et Al. (2013). *Academic Careers: A Cross Country Perspective.* Welfare, Wealth and Work for Europe. [Online]. Available at: <https://www.wifo.ac.at/bibliothek/archiv/36247/WWWforEurope_WP_037.pdf> [Accessed: 4th February 2024]

Lantsoght, E. (2023). *Thriving on the tenure track in the Netherlands.* [Online]. Available at: <https://www.academictransfer.com/en/blog/thriving-on-the-tenure-track-in-the-netherlands/> [Accessed: 17th March 2024]

LERU. (2014). *Tenure and Tenure Track at LERU Universities*. League of European Research Universities. [Online]. Available at: <https://www.leru.org/publications/tenure-and-tenure-track-at-leru-universities-models-for-attractive-research-careers-in-euro> [Accessed: 1st December 2023].

Max Planck Institute for Software Systems. (No date). *Academic Jobs in CS in Spain.* [Online]. Available at: <https://people.mpi-sws.org/~roseh/jobs/spain.html> [Accessed: 18th March 2024]

Miarka, P. (2019). *Benefits of Dark Background on your Website.* [Online]. Available at: <https://www.droptica.com/blog/benefits-dark-background-your-website/> [Accessed: 17th March 2024]

NordForsk. (2024). *Gender equality policies bring more women to the top of academia.* [Online]. Available at: <https://www.nordforsk.org/news/gender-equality-policies-bring-more-women-top-academia#:~:text=Norway%20leads%20in%20gender%20equality,how%20to%20promote%20gender%20equality>. [Accessed: 29th March 2024]

O’Connor, P. (2023). ‘*The Tenure Track Model: Its Acceptance and Perceived Gendered Character.’* Trends in Higher Education. Available at: <https://www.mdpi.com/2813-4346/2/1/5> [Accessed: 24th February 2024]

O’Connor, P. (2015). *It’s Not Clear that Tenure Track will Help Women.* [Online]. Available at: <https://universitytimes.ie/2015/10/its-not-clear-that-tenure-track-will-help-women/> [Accessed: 29th March 2024]

Outsuka, M. (2019). *Is there Academic Tenure in the UK?* [Online]. Available at: <https://mikeotsuka.medium.com/is-there-academic-tenure-in-the-uk-93aecc388616> [Accessed: 11th February 2024]

Peters, D. (2021). *The mismatch continues between PhD holders and their career prospects.* University Affairs. [Online]. Available at: <https://universityaffairs.ca/news/news-article/the-mismatch-continues-between-phd-holders-and-their-career-prospects/> [Accessed: 25th March 2024]

Posit. (2022). *Share your Shiny Applications Online.* [Online]. Available at: <https://www.shinyapps.io/> [Accessed: 29th February 2024]

[Radečić](https://appsilon.com/author/dario/), D. (2022). *R Shiny vs Shiny for Python - What are the key Differences?* [Online]. Available at: <https://appsilon.com/r-shiny-vs-shiny-for-python/> [Accessed: 18th February 2024]

RConsortium. (No date). *What is the R Consortium?.* [Online]. Available at: <https://www.r-consortium.org/> [Accessed: 25th March 2024]

Reichman, H. (2023). *Eight Myths about Tenure.* American Association of University

Professors. [Online]. Available at: <https://www.aaup.org/article/eight-myths-about-tenure> [Accessed: 7th February 2024]

Severo Ochoa Centre for Molecular Biology (CBMSO). (No date). *Ramón y Cajal y Talento Programs.* [Online]. Available at: <https://www.cbm.uam.es/en/research/ramon-y-cajal-program> [Accessed: 18th March 2024]

Shiny. (2017). *The Basic Parts of a Shiny App.* [Online]. Available at: <https://shiny.posit.co/r/articles/start/basics/> [Accessed: 18th February 2024]

Statistics Canada. (2022). *Differences in tenure status and feelings of fairness in hiring and promotions among male and female faculty in Canadian universities.* [Online]. Available at: <https://www150.statcan.gc.ca/n1/pub/75-006-x/2022001/article/00007-eng.htm> [Accessed: 29th March 2024]

Statistics Canada. (2021). *5.2 Bar Chart.* [Online]. Available at: <https://www150.statcan.gc.ca/n1/edu/power-pouvoir/ch9/bargraph-diagrammeabarres/5214818-eng.htm> [Accessed: 17th March 2024].

Statistics Canada. (2021). *Number and salaries of full-time teaching staff at Canadian universities (final), 2020/2021.* [Online]. Available at: <https://www150.statcan.gc.ca/n1/daily-quotidien/211213/dq211213a-eng.htm> [Accessed: 19th March 2024]

[Storożenko](https://appsilon.com/author/pasza/), P. (2023). *Choosing the Right Data Dashboard Tool: The Unique Strengths of Streamlit and Shiny.* [Online]. Available at: <https://appsilon.com/streamlit-or-shiny-for-life-scientists/> [Accessed: 29th February 2024]

Taggart, E. (2021). *The Long Road To Gender Equality in Academia.* University Times. [Online]. Available at: <https://universitytimes.ie/2021/02/the-long-road-to-gender-equality-in-academia/> [Accessed: 25th March 2024]

Trinity College Dublin (TCD). (2020). *Tenure Track Reviews: Criteria and Objectives.* [Online].Available at: <https://www.tcd.ie/hr/spr/tenure-track/criteria.php> [Accessed: 24th February 2024]

Trinity College Dublin (TCD). (2019). *Tenure Track Procedures for new Assistant Professors.* Available at: <https://www.tcd.ie/hr/assets/pdf/procedure60-tenure-track.pdf> [Accessed: 24th February 2024]

Trinity College Dublin (TCD). (2015). *Trinity Begins Global Recruitment Campaign for 40 New Academic Posts*. [Online]. Available at: <https://www.tcd.ie/news_events/articles/trinity-begins-global-recruitment-campaign-for-40-new-academic-posts/> [Accessed: 24th February 2024]

Trinity College Dublin (TCD). (No date). *Leru.* Available at: <https://www.tcd.ie/about/leru/> [Accessed: 7th April 2024]

Tiede, H. (2022). *The 2022 AAUP Survey of Tenure Practices.* American Association of University Professors. [Online]. Available at: <https://www.aaup.org/report/2022-aaup-survey-tenure-practices> [Accessed: 10th January 2024].

Tiede, H. (2023). *Winter 2023: What’s Happening to Tenure? A New Deal For Tenure* American Association of University Professors. [Online]. Available at: <https://www.aaup.org/article/new-deal-tenure> [Accessed: 7th February 2024]

University College Cork (UCC). (2022). *A National and International Review of the Classification of Academic Titles.* [Online]. Available at: <https://www.ucc.ie/en/media/support/hr/AcademicTitlesReview.pdf> [Accessed: 24th February 2024]

University of Limerick (UL). (2023). *Policy and Procedures for Granting Multi-annual Status to Tenure Track Academic Staff.* [Online]. Available at: <https://www.ul.ie/media/34977/download?inline> [Accessed: 24th February 2024]

University of Helsinki. (No date). *University of Helsinki Tenure Track.* [Online]. Available at: <https://www.helsinki.fi/en/about-us/careers/academic-careers/university-helsinki-tenure-track#:~:text=The%20University%20of%20Helsinki%20tenure,assessed%20during%20the%20recruitment%20process>. [Accessed: 29th March 2024]

University of Limerick (UL). (2017). *UL Continues to Lead the way towards Bridging the Gender Gap in Higher Education.* [Online]. Available at: <https://www.ul.ie/news/ul-continues-to-lead-the-way-towards-bridging-the-gender-gap-in-higher-education-0> [Accessed: 25th March 2024]

Van de Meent, Y. (2023). *Ending tenure tracks does not automatically put an end to pressure to perform.* [Online]. Available at: <https://www.aob.nl/en/actueel/artikelen/einde-tenure-tracks-maakt-niet-automatisch-einde-aan-prestatiedruk/> [Accessed: 17th March 2024].

Wapman, K. et al. (2022). *Quantifying hierarchy and dynamics in US faculty hiring and retention.* [Online]. Available at: <https://www.nature.com/articles/s41586-022-05222-x> [Accessed: 1st March 2024]

Dashboard Data Literature

***CONTRACT TYPE DATA***

**Austria, Finland, Norway, Sweden:**

Frølich, N. et al. (2018). *Academic Career Structures in Europe. Perspectives from Norway, Denmark, Sweden, Finland, the Netherlands, Austria and the UK.* Nordic Institute for Studies

in Innovation, Research and Education (NIFU). [Online]. Available at: <https://www.khrono.no/files/2018/02/28/NIFUreport2018-4.pdf> [Accessed: 11th February 2024]

**Canada:**

Higher Education Strategy. (2017). *Replacing Permanent Faculty.* [Online]. Available at: <https://higheredstrategy.com/replacing-permanent-faculty/> [Accessed: 25th February 2024]

**Germany:**

[Netzwerk für Gute Arbeit in der Wissenschaft](https://twitter.com/intent/user?screen_name=NGA_Wiss). (No date). *Precarity is the true face of ‘excellence.’* [Online]. Available at: <https://mittelbau.net/demands-of-the-network-for-decent-labour-in-academia/> [Accessed: 27th February 2024].

**Ireland:**

O’Connor, P. (2023). *The precarious employment of staff in Irish Higher Educational institutions and its policy implications.* [Online]. Available at: <https://publicpolicy.ie/education/the-precarious-employment-of-staff-in-irish-higher-educational-institutions-and-its-policy-implications/> [Accessed: 25th February 2024]

**Netherlands:**

Frølich, N. et al. (2018). *Academic Career Structures in Europe. Perspectives from Norway, Denmark, Sweden, Finland, the Netherlands, Austria and the UK.* Nordic Institute for Studies

in Innovation, Research and Education (NIFU). [Online]. Available at: <https://www.khrono.no/files/2018/02/28/NIFUreport2018-4.pdf> [Accessed: 11th February 2024]

OECD. (2019). *Benchmarking Higher Education System Performance: The Netherlands.* [Online]. Available at: <https://gpseducation.oecd.org/Content/ProjectsMaterial/BenchmarkingHESystemPerformance_NLD.pdf> [Accessed: 25th February 2024]

**United Kingdom:**

Higher Education Statistics Agency (HESA). (2021). *Higher Education Staff Statistics: UK, 2019/20.* [Online]. Available at: <https://www.hesa.ac.uk/news/19-01-2021/sb259-higher-education-staff-statistics> [Accessed: 25th February 2024]

**United States:**

AAUP. (2023). *Data Snapshot: Tenure and Contingency in US Higher Education.* [Online]. Available at: <https://www.aaup.org/article/data-snapshot-tenure-and-contingency-us-higher-education> [Accessed: 25th February 2024]

National Center for Education Statistics. (2021). *Race/Ethnicity of College Faculty.* [Online]. Available at: <https://nces.ed.gov/fastfacts/display.asp?id=61> [Accessed: 25th February 2024]

***GENDER STATISTICS DATA***

**Austria:**

Federal Ministry Republic of Austria. (2018). *Gender Equality in Science and Research in Austria.* [Online]. Available at: <https://www.bmbwf.gv.at/dam/jcr:4e010028-216f-4e71-8fbe-f3d1a64b0e44/Gender%20Equality%20in%20Science%20and%20Research%20in%20Austria%20(Kurzfassung%20englisch,%20PDF,%205,5%20MB).pdf> [Accessed: 10th February 2024]

**Canada:**

Statistics Canada. (2021). *Number and salaries of full-time teaching staff at Canadian universities (final), 2020/2021.* [Online]. Available at: <https://www150.statcan.gc.ca/n1/daily-quotidien/211213/dq211213a-eng.htm> [Accessed: 19th March 2024]

**Denmark:**

[Høg Uto](https://www.researchgate.net/profile/Ea-Hog-Utoft?_tp=eyJjb250ZXh0Ijp7ImZpcnN0UGFnZSI6Il9kaXJlY3QiLCJwYWdlIjoiX2RpcmVjdCJ9fQ)ft, Ea. (2020). *Share of female assistant, associate, and full professors at all Danish universities, 2007-2017.* [Online]. Available at: <https://www.researchgate.net/figure/Share-of-female-assistant-associate-and-full-professors-at-all-Danish-universities_fig2_341671464> [Accessed: 11th February 2024]

**Finland:**

University of Helsinki. (No date). *University of Helsinki Tenure Track.* [Online]. Available at: <https://www.helsinki.fi/en/about-us/careers/academic-careers/university-helsinki-tenure-track#:~:text=The%20University%20of%20Helsinki%20tenure,assessed%20during%20the%20recruitment%20process>. [Accessed: 29th March 2024]

**Ireland:**

Higher Education Authority (HEA). (2022). *Gender Equality in Irish Higher Education.* [Online]. Available at: <https://hea.ie/assets/uploads/2022/03/Gender-Equality-in-Irish-Higher-Education-2016_2021.pdf> [Accessed: 11th February 2024]

**Italy:**

Filandri, M. and Pasqua, S. (No date). *‘Being good isn’t good enough’: Gender discrimination in the Italian Academia.* [Online]. Available at: <https://siecon3-607788.c.cdn77.org/sites/siecon.org/files/media_wysiwyg/123-filandri-pasqua.pdf> [Accessed: 10th February 2024]

**Netherlands:**

Rathenau Instituut. (2023). *Women in Academia.* [Online]. Available at: <https://www.rathenau.nl/en/science-figures/personnel/women-science/women-academia> [Accessed: 11th February 2024]

**United States:**

AAUP. (2020). *Data Snapshot: IPEDS Data on Full-Time Women Faculty and Faculty of Color.* [Online]. Available at: <https://www.aaup.org/sites/default/files/Dec-2020_Data_Snapshot_Women_and_Faculty_of_Color.pdf> [Accessed: 10th February 2024]

American Association of University Women (AAUW). (No date). *Fast Facts: Women Working in Academia.* [Online]. Available at: <https://www.aauw.org/resources/article/fast-facts-academia/> [Accessed: 10th February 2024]

***LENGTH OF TT DATA***

**TO DO**