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## FOOTLOOSE AND UNFETTERED: LOCATION CHOICE OF A NOMADIC LABOR FORCE

**Christine Isakson**

DRUID, CBS  
ci.ino@cbs.dk

**Michael S. Dahl**

DRUID, AAU  
md@business.aau.dk

**Abstract:**

Footloose and Unfettered: Location Choice of a Nomadic Labor Force

Christine Isakson

Copenhagen Business School

Department of Innovation and Organizational Economics

Danish Research Unit for Industrial Dynamics (DRUID)

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Previous research has shown that individuals tend to prefer to settle near family, friends and familiar regions (Dahl & Sorenson 2008). The purpose of this paper is to determine if, when given unfettered freedom to choose where to live, individuals continue to choose to settle near family and familiar regions.

This paper examines the Danish seagoing merchant mariner, which is largely a nomadic labor force with no deep roots (home regions), to see where they choose to settle when they leave their seagoing jobs and come ashore. This is novel in that past work has determined that employees typically settle where they have deep roots (Dahl & Sorenson 2008). We ask, in the case of the Danish merchant mariner who chooses to come ashore, if they work at sea and live a large portion of their life at sea, what is the likelihood that when they chose to come ashore that they will settle near family and familiar regions? In addition, we study whether the merchant mariner reduces the attachment to family and familiar regions, the longer they have been at sea as well as when compared to ordinary employees in Denmark.

We hypothesize that when individuals have no deep roots in the location of their home or prior residences, they will choose to settle near family and friends as is indicated by prior research. But we also argue that mariners are less attached to their family given the long periods that they have spent at sea.

Utilizing the Danish Integrated Database for Labor Market Research (IDA) combined with a unique dataset provided by the Danish Maritime Authority, allows us to use the Danish merchant mariner as our footloose labor force. This dataset includes all merchant mariners, of all levels who have worked onboard Danish vessels from 1986 through 2008.

All individuals who are at sea at for significant periods for two consecutive years who then choose to come ashore (not going to sea at all) for the third consecutive year are looked at in this study. For example, the first group we look at is at sea for the years 1998 and 1999, but on land in 2000. We examine six groups in this way

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# Footloose and unfettered: Location choice of a nomadic labor force

Christine D. Isakson & Michael S. Dahl

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## Abstract

Previous research has shown that individuals tend to prefer to settle near family and familiar regions. The purpose of this paper is to determine whether footloose individuals with no deep roots, when given unfettered freedom to choose where to live, continue to choose to settle near family and familiar regions. We examine the mariner as our footloose workforce with the assumption that mariners are even less attached to their families, in comparison to the rest of the population, due to the long periods spent at sea.

## 1 Introduction

Previous research has shown that individuals tend to prefer to settle near family, friends and familiar regions (Dahl Sorenson 2008). However, this research has focused exclusively on the migration of land-based workers. The question is whether the preference to locate near family and regions are influenced by the degree to which frequent contact with parents, siblings or adult children is possible. Is it so that nomadic labor styles, where frequent contact is impossible, will increase or decrease the preference for locating near families? This is largely an unexplored question. If relationships to families decrease in importance for certain professions lifestyles, such as mariners, soldiers and other nomadic personnel, it is important to understand the social effects of such occupations for the individuals involved.

This paper examines the Danish seagoing merchant mariner, which is largely a nomadic labor force with potentially weaker roots to certain locations, to see where they choose to settle when they leave their seagoing jobs and come ashore. Past work has determined that employees typically settle where they have deep roots (Dahl Sorenson 2008). We ask, in the case of the Danish merchant mariner who chooses to come ashore, if they work at sea and live a large portion of their life at sea, what is the likelihood that when they

chose to come ashore that they will settle near family and familiar regions? In addition, we study whether the merchant mariner reduces the attachment to family and familiar regions, the longer they have been at sea as well as when compared to ordinary employees in Denmark. Thus, we analyze how the weaker roots of the nomadic labor styles potentially influence their choices. We do this by utilizing the Danish Integrated Database for Labor Market Research (IDA) combined with a unique dataset provided by the Danish Maritime Authority, which allows us to use the Danish merchant mariner as our footloose labor force. This dataset includes all merchant mariners, of all levels who have worked onboard Danish vessels from 1986 through 2008.

### Location Choice

When making a location choice, there are many benefits to locating near family. Aside from the emotional benefits that come with having family nearby, there may be economic advantages as well. For example, in the case working couples with children, living near parents and siblings may assist in the way of family logistics and childcare. When evaluating regions for employment opportunities, family may also provide local knowledge and detailed information on the job market that may otherwise be difficult to come by.

The search for more lucrative employment opportunities is perhaps the most frequently proposed driver of geographic mobility. Previous research on international migration often touches on the prospect to earn more as prime motivator for individuals to move to wealthier countries (Portes Borocz, 1989). However, focusing on the domestic migration of workers allows one to more clearly determine movements based on choice, as they are not affected by immigration policies put in place by governments. These policies may be put in place to attract a specific class of individual based on education or profession. This type of filtering through policy makes it difficult to determine the preferred choice of an individual due to the limitations of migratory opportunity that are imposed by such policy. This may account for the fact that certain professions, such as engineers and scientists, appear to be more mobile across countries than the general population (Dumont Lamaitre, 2005) when examining migration across national borders.

Much of the previous research on labor mobility literature has painted the mobile worker as itinerant, wandering and uncommitted to organization. Though recent research has come to refute the inverse connection between mobile worker's commitment to organization and mobility (Pittinsky Shih, 2004), we know very little about the level of social attachment a mobile worker retains when they spend much of their time away from home. In this case, the nomadic worker's place of employment is geographically separated from their place of residence. Indeed for these individuals, the place where they work and the place they call 'home' are a great distance from one another, and often times their work place is in constant motion as in the case of journalists, military contractors, long haul airline workers, truck drivers, mariners, and many types of consultants and diplomats. While they would not call their workplace 'home', they do have a stationary, permanent 'home'.

It is not necessary for them to move their place of residence whenever they change jobs. In fact, they may choose to live on a mountaintop during their off time, if they so choose, since they may only have to travel once a month, or twice a year, to report to their workplace. This gives them a special kind of freedom when making a location choice. They become footloose and unfettered in their hunt for a home. However, unlike the majority of the population, these individuals travel far from their land-based homes and in some cases, for very long periods of time. The working conditions with regard to level of social isolation from the rest of the world, vary from job to job. Many of these types of jobs take workers to remote locations where communication is virtually impossible for days, weeks, or maybe months at a time. Under these circumstances, it is difficult for individuals to maintain close contact to family and friends back home, causing them to gradually lose the cultural commonalities and closeness that come with shared everyday experiences.

Such a lifestyle can allow an individual great freedoms. But it is where they chose to relocate when they decide to discontinue living a nomadic lifestyle, and live in such a way that 'home' and work are within a commutable distance from each other, that we are interested in. When they make that location choice, does family play a greater or lesser part in that decision for these workers? The emotional distance from loved ones would seem to be cumulative and increase over time, the longer the worker retained nomadic lifestyle. One might deduce that a nomadic worker would truly be unfettered when making a new location choice. Though the economic advantages that family, through both regional knowledge and trusted support, can provide may prove to be of vital importance when seeking new job opportunities.

We hypothesize that when individuals have no deep roots in the location of their home or prior residences, they will choose to settle near family and friends as is indicated by prior research. But we also argue that mariners are less attached to their family given the long periods that they have spent at sea.

We use this study of the migration patterns of 4,094 former mariners to compare to the migrations patterns of a random sample of other workers to examine, whether the periods of time spent at sea changes the weight put on location of family. We show that individuals will tend to settle near family and familiar regions, but that nomadic labor place less weight on locating near family, particularly the more time they have spent at sea.

## 2 Data and methods

Our analysis of the location choices of Danish mariners assumes that individuals rationally compare the pros and cons of working in one region against those of other regions and choose the region that offers the greatest net benefits. It further assumes that one can decompose the pros and cons that regions provide into an additive set of salient regional characteristics. Given these assumptions, we can write the utility that an individual  $i$  would receive from living in a particular region,  $j$ , as:

$$u_{ij} = \beta' x_{ij} + \epsilon_{ij}, \quad (1)$$

where  $x_{ij}$  represents a vector of region-specific attributes for individual  $i$  (e.g., distance to parent's residence or siblings),  $\beta$  denotes a vector of weights that the individual assigns to each of those attributes, and  $\epsilon_{ij}$  allows for error in individuals' evaluations of the satisfaction that they would receive from locating in region  $j$ —for example, because of other unobserved attributes of the region.

If individuals choose locations to maximize the utility specified in (1) and if we assume that the errors ( $\epsilon_{ij}$ ) arise from independent and identically distributed draws from an extreme value distribution (Type 1), then the probability that individual  $i$  chooses region  $j$  is:

$$P(y_i = j) = \frac{e^{\beta' x_{ij}}}{\sum_J e^{\beta' x_{ij}}} \quad (2)$$

We can estimate (2) and the weights for the regional characteristics with the conditional logit, also known as a McFadden choice model McFadden:1974.

The database used in this study is Labor Database from Statistics Denmark (also known as the IDA database in Denmark). This dataset includes information on the entire Danish population. It provides us with panel data on an individual's marital status, familial status, home location, as well as educational and employment history. The IDA database is rich dataset and has recently been used for prior research. What makes it particularly interesting in this case is that it has been combined with another unique and extensive database, the Danish Mariners Database.

The Mariners Database is a dataset that has been provided by the Danish Maritime Authority and includes all individuals who have sailed on Danish vessels between 1986 and 2008. Also included in the database are the dates that an individual signs on and signs off of a vessel. Knowing this, we can determine how many days an individual is at sea within a given year ('sea days') as well as how many years an individual goes to sea throughout his or her career (between 1986-2006). Individuals in the mariners database have been linked up with the information in the IDA database making it possible to follow an individual mariner throughout both databases, allowing us to use the Danish merchant mariner as

our footloose labor force. Combining these two datasets provides us with a definitively unique and extremely rich source of information.

## 2.1 Samples

For our study, we have examined the location choice of a group of mariners that we refer to as 'switchers'. We chose to look at individuals who have been working at sea, as their primary occupation, for at least two consecutive years and then who chose to be on land for the third year (staying ashore for at least one year). We include only those who have been at sea for two consecutive years to capture the footloose quality of the mariner. We chose to require that the individual be on land for the third year because we consider it an indicator that the individual was making a new lifestyle choice. We then look at all individuals who move during that third year and examine their new location choice.

<sup>1</sup>

Both foreign and domestic mariners are included in this dataset. While domestic (Danish) mariners are easily tracked through both the mariner's database and the IDA database due to their personal CPR numbers, it is not possible to do the same with the foreign mariners sailing on Danish vessels. Since foreign mariners sailing on Danish vessels are not issued a Danish personal (CPR) number, it is not possible to follow them through the IDA database and therefore not possible to determine their location choice. This results in all foreign workers being excluded from the study.

All individuals who are at sea at for significant periods for two consecutive years who then choose to come ashore (not going to sea at all) for the third consecutive year are looked at in this study. For example, the first group we look at is at sea for the years 1997 and 1998, but on land in 1999. We examine six groups in this way (1997/1998/1999...2003/2004/2005). We model their location choice in each year in a discrete choice model adjusting for the location of their family, home region and past regions of residence. We also examine how their choice of location is influenced by size of regions and the availability of firms in maritime-related industries.

We use this study of the migration patterns of 4,094 former mariners to compare to the migrations patterns of a random sample of other workers to examine, whether the periods of time spent at sea changes the weight put on location of family. We show that individuals will tend to settle near family and familiar regions, but that nomadic labor place less weight on locating near family, particularly the more time they have spent at sea. For this sample

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<sup>1</sup>At this juncture it may be important to note that a mariner may commonly chose to be ashore for a year, just to take "a bit of time off". As we progress in this study, we may chose to require that an individual be ashore for more than a year in order to more accurately capture the likelihood of a change in lifestyle.

of comparison, we took a random sample of 4,094 individuals living in Denmark between 1997 and 2005, who are over the 17 years of age and under 66.

## 2.2 Variables

The dependent variable is the location choice that the mariner makes when they choose to stop going to sea, stay ashore and move to a new location. In the conditional logit, the dataset includes one observation per possible location per individual, where we can compare the characteristics of each location to each other for every individuals. We have 271 different locations (Danish *kommunes*) that an individual can choose from. With 4,094 former mariners, this gives us 1,109,474 observations in the regressions.

We created a number of variables to better understand how likely an individual is to choose a location near family, friends and former co-workers.

*Ln (distance to home)* accounts for the distance from the home municipality of the prior year, to the new home municipality, measured in logged kilometers.

*Ln (distance to prior residences)* measures the distance between the municipalities that the individual lived in during the two years previous to the move, and the new home municipality. Again, measured in logged kilometers. If the individual lived in more than one municipality, we averaged the logged kilometers between the municipalities.

*Ln (distance to parents)* measures the distance between the municipality in which the parents live and the municipality in which the individual has chosen to move to. In the case where the two parents are living in different municipalities, an average of the two is calculated. The distance is measured in logged kilometers.

*Ln (distance to siblings)* measures the distance, in logged kilometers, between the municipality in which their brothers and sisters live and the municipality in which the individual has chosen to move to.

*Ln (city size)* the logged number of individuals employed within the municipality.

*Seadays* counts the number of days an individual works on a vessel. Each time a mariner boards a ship to sign on for work, the date is recorded and reported to the government authorities. The same applies for the sign off date. This allows us to calculate how many days a mariner has been onboard, working on a given ship.

*Planned variable (in progress):*

*Ln (distance to past co-workers)* accounts for the average distance from co-workers that the individual has worked with on vessels within the previous two years.

### 3 Results

We estimate conditional logit regressions on location choice of former mariners returning to land. Table 1 presents the initial regressions of this kind. We first analyze the basic effects of distance to home (current location), distance to prior residences and city size in Model 1. We find that all three factors are influencing the location choice of the mariners returning to land. Mariners have a preference for locating near current location (minimize the distance as shown with the significant and negative sign) and large cities. When we add further control for the importance of prior residences (in Model 2), we see a drop in the effect of the current home region, but otherwise there is no effect. These findings largely reflects that former mariners as a preference for staying in the current locations (as also found for regular wage earners by Dahl Sorensen (2008)).

In Model 3, we add predictors for parents and siblings into the equation. We find that parents have the opposite effect from what we would expect. Former mariners have a preference for locating away from the parents. A finding that comes from the situation that we control for the current residence. If this is removed, we find a negative effect for distance to parents meaning that they want to decrease distance. On other hand, we find that former mariners move closer to siblings.

Table 1: Conditional Logit Regressions on the Location Choice of Former Mariners

	Mariners 1	Mariners 2	Mariners 3	Comparison group 4
Ln (distance to home)	-1.950*** (0.02)	-1.612*** (0.03)	-1.618*** (0.03)	-2.451*** (0.03)
Ln (city size)	0.617*** (0.03)	0.616*** (0.03)	0.602*** (0.03)	0.403*** (0.05)
Ln (distance to prior residences)		-0.592*** (0.05)	-0.593*** (0.05)	-4.381*** (0.75)
Ln (distance to parents)			0.147*** (0.04)	0.968*** (0.27)
Ln (distance to siblings)			-0.217*** (0.05)	0.207 (0.35)
Pseudo $R^2$	0.82	0.82	0.83	0.92
Observations	1109474	1109474	1109474	1088336

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The more interesting question in this paper is the comparison between former mariners and other types of labor. We add a regression on the same variables, but for a random sample of land-based employees. In comparison, we see that mariners put less weight on locating near their current residence and prior residences, but are more likely to locate in larger cities. The family factors are more mixed. While mariners put relatively more weight on locating near siblings, this has the opposite effect for the comparison group. Parents oddly have a more repelling effect for land-based workers.

The results are mixed in terms of the comparison between mariners and land-based workers. It does not seem clear that mariners are becoming less attached to families and past locations at the same time. Another question is whether the degree to which mariners choose locations influenced by where their families are located differ depending on how much time they have spend at sea. So far, we treated them as one group. However, their careers and lifestyles vary to large extent. In the following section, we have divided the mariners into four different groups, depending on their average number of sea days, for the last five years of their career at sea. We run separate regressions for each group to analyze, whether the number of sea days influence the factors that are important for their choice of location. These are shown in Table 2.

Table 2: Conditional Logit Regressions on the Location Choice of Former Mariners (by average number of sea days)

Number of average seadays	Lowest 33	Low 88	High 154	Highest 270
Ln (distance to home)	-1.562*** (0.06)	-1.643*** (0.06)	-1.587*** (0.06)	-1.666*** (0.07)
Ln (distance to prior residences)	-0.353*** (0.10)	-0.435*** (0.10)	-0.720*** (0.11)	-0.941*** (0.14)
Ln (distance to parents)	-0.127* (0.08)	0.145** (0.07)	0.161* (0.09)	0.225* (0.12)
Ln (distance to siblings)	-0.547*** (0.09)	-0.084 (0.08)	-0.077 (0.09)	-0.078 (0.13)
Ln (city size)	0.708*** (0.05)	0.671*** (0.05)	0.611*** (0.05)	0.362*** (0.07)
Pseudo $R^2$	0.81	0.81	0.82	0.87
Observations	277504	277504	277233	277233

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

It is clear that the individual lifestyles of mariners affect the importance lend to the location of families. Mariners belonging to the lowest number of sea days category are more likely to located near both parents and siblings. The more sea days they have had, the less

important the families become for their location choice. On the other hand, this group is much less likely to locate near prior residences, although the effect here is large for all groups.

## Appendix

**Mariners** This paper makes reference to the modern day merchant mariner. The term mariners may apply to both merchant mariners, who are civilians, and mariners employed by a government's navy. This paper uses the term mariner to describe merchant mariners (civilians), including those employed on smaller vessels such as supply vessels and fishing boats.

**Individual Mariners** A typical merchant vessel can be broken down in to three departments and two levels. The three departments are the deck department (also known as navigation), the engineering department and the stewards department. The two levels are 'licensed' (the individual may also be referred to as an 'officer' or 'licensed officer') and 'unlicensed'.

The deck department is responsible for the safe navigation and maintenance of the vessel. Typically, they are responsible for the maintenance of the deck (not including the mechanical elements of the deck gear), docking and undocking the vessel, and all elements involving cargo operations. The deck department is also responsible for the inspection and maintenance of all safety equipment on the vessel. The department is composed of both 'licensed' and 'unlicensed' crew members.

The engine department is responsible for the safe working order of the vessel's machinery. Typically, the engineering department work 'down below' in the engine room. They are also typically responsible for the maintenance and repair of the deck equipment, such as cargo cranes and mooring winches. They will also be in charge of all fuel transfers and change in power supplies (on shore power or ship's generators). The department is composed of both 'licensed' and 'unlicensed' crew members.

The stewards department is typically responsible for the upkeep of the 'house' or living quarters of the vessel. They are responsible for providing all the meals on the vessels, as well as for the upkeep of the galley, the dining areas and all interior common areas. On many vessels they are also responsible for crew laundry and the daily cleaning of officers' living quarters. The stewards department is also responsible for ordering necessary food and sundries. The department is composed of 'unlicensed' crew members only. Smaller vessels, such as fishing boats, are commonly devoid of a stewards department.

*Shipboard Positions:*

*Deck Department (licensed)*

Master/ Captain

Chief Officer/First Mate

Second Officer/Second Mate

Third Officer/ Third Mate

*Deck Department (unlicensed)*

Boatswain/Bosun

Able Seaman (AB)/Deckhand

Ordinary Seaman (OS)

*Engineering Department (licensed)*

Chief Engineer

First Assistant Engineer

Second Assistant Engineer

Third Assistant Engineer

*Engineering Department (unlicensed)*

Junior Engineer

Oiler

Greaser

Wiper

*Steward's Department (unlicensed)*

Chief Steward

Chief Cook

Steward's Assistant

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