# Natural and Structural Migrations: Refining Migration Classifications

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**Abstract**

Migration is a major engine of demographic change for town, regions, and whole countries. Traditionally, migrations have been divided into push or pull migrations, or classified by events that triggered them. Borrowing from labor economics, this presentation distinguishes between natural and structural migrations. This classification scheme is compatible with and complementary to existing classifications. It yields some additional insights both for policy making, empirical research, and migration modeling.

## 1. Introduction

Migration is a significant force in changing the populations of towns and cities, regions, and whole countries. Large numbers of people moving from one place to another impact labor, housing, and consumer markets, as well as tax revenues and the demand for government services. The arrival of large numbers of newcomers can also change the political landscape and impact the environment. All of these are reasons for studying migrations empirically and theoretically.

To start, we define migration as a change of location and residence for a duration beyond a few weeks and to a location beyond commuting distance. For empirical research, duration and distance of the move need to be specified, but for our purposes, this general definition is sufficient. The U.S. Census Bureau (2021, italics in original) offers a similar definition: "*Migration* typically refers to moves that cross a boundary, such as a county or state line, and is either *domestic migration* (movement within the U.S.) or *international migration* (movement between the U.S. and other countries)."

Distinctions between different migration types can be based on the duration (permanent vs. temporary or seasonal), motivation (amenities, economic opportunities, education or training), timing (graduation and job search, retirement when movers are no longer constrained by the availability of work), disasters (flooding, large-scale fires), or politics (dictatorships) and wars. A common binary definition distinguishes between push (deteriorating economy, disaster) and pull (environmental amenities such as scenery and/or climate; growing economic opportunities; favorable tax rates) migration.

Not all migrations are entirely voluntary[1]. An example of a large involuntary migration still on the minds of many adult Americans is the permanent displacement of residents of New Orleans in the aftermath of Hurricane Katrina in 2005. Such disasters cause literal push migrations. Push factors behind migrations, in addition to natural disasters, include war or the decline of a once dominant industry (steel, coal) or labor-saving technological change (coal, automobile industry). Migration-inducing changes in an industry may be caused by changes that render some products obsolete, international competition, and the replacement of workers by machines.

Definitions of migrations can be mutually exclusive, complementary, or overlapping. For example, some migrants may simultaneously experience push and pull factors, as included in mathematical models of push-pull migrations (e.g., Dorigo and Tobler, 1983). This contribution adds two new migration types: natural and structural migrations, respectively, and we will show

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[1] The distinction between voluntary and involuntary migration is fuzzy. For the purpose of this paper we will only refer to migrations that come about because of natural disasters or forced displacement as involuntary. Political migrations contain examples that are cannot always easily be classified as either voluntary or involuntary. For more discussion, see Schaeffer (2010).

that these new definitions complement existing ones. In the remainder of this paper we will introduce these two distinctions and discuss their implications as well as their relationship to previously established definitions. We begin in section 2 by exploring the fundamental question why people migrate. Based on the results of our exploration, in section 3 we define natural and structural migrations. This is followed in section 4 by a discussion of the relevance of the difference between these two migration types for public policy and how they relate to other migration classifications. Section 5 discusses implications for theory. The paper ends with a summary and conclusions.

## 2. Why do People Move?

In the following discussion we use the term "migrant" or "subject." However, migration is not necessarily the result of individual decision making. When families move, their choices may differ from those that individual members would have made, had the moved alone (Mincer 1978) and, in addition, even individual migrants' decisions may be influenced by others, for example, through material support for some choices over others, or recruitment and information by relatives or friends who had migrated before. Additionally, although most of the migration literature treats migration as a once in a lifetime event (mostly because of a lack data about repeated migration), repeat migrations as a result of disappointment with the results of a move or as a deliberate career strategy are not uncommon (for a theoretical treatment, see Schaeffer 1985). An empirical study with the then newly available data from the Panel Study of Income Dynamics (PSID) found that in the United States the majority of the moves across boundaries of Standard Metropolitan Statistical Areas or nonmetropolitan State Economic Areas, were made by migrants who had moved at least once before (DaVanzo 1983).

Why do people migrate? To answer this question, we use a simple thought experiment. Consider a migrant who has achieved a Pareto optimal location and therefore has no incentive to move. What would have to happen for this Pareto optimum to be disturbed? In the most general terms, there are two possibilities. First, the subject changes, which we refer to as a *change or changes internal to the subject*. If the subject is an individual, examples of such changes include graduation from high school or college, marriage or divorce, a large inheritance, retirement, discharge from serving in the military, or a job promotion. If the subject is a household, then in addition children reaching school age may motivate a relocation to a place more suitable for raising children, including having better schools.

The second possibility is that the subject did not change, but the subject's environment did, that is, a *change or changes external to the subject*. If the migration-inducing change occurs elsewhere it leads to pull migration and if it occurs at the subject's present location to push migration.

Based on these two basic reasons why people may decide to move, and borrowing from Milton Friedman (1968), we call migration caused by changes internal to the subject *natural migration*, and those caused by changes external to the subject *structural migration*. In the next paragraphs, we explain why this distinction is important. We treat natural and structural migrations as distinct

processes although it is possible that a migrant is simultaneously motivated by internal and external changes and official statistics do not distinguish between them. While the theoretical distinction between these two migration types is unambiguous, mixed motivations may obscure differences in empirical research.

Previous migration research focused on the subject and its preferences and motivations, for example for warmer climates in the American South and Southwest, that is pull and push factors (Ravenstein 1885, 1889; Dorigo and Tobler 1983). We approach the question differently by considering a subject who perceives the current location as the best available choice. We refer to "available choices" to indicate that there may be even better choices that are, however, unavailable because of constraints, such as sufficient job opportunities for working-age adults. Such a subject can be said to be in equilibrium with respect to its location. The new classification offered here results from answering the question what would have to occur for the existing equilibrium to be disturbed.

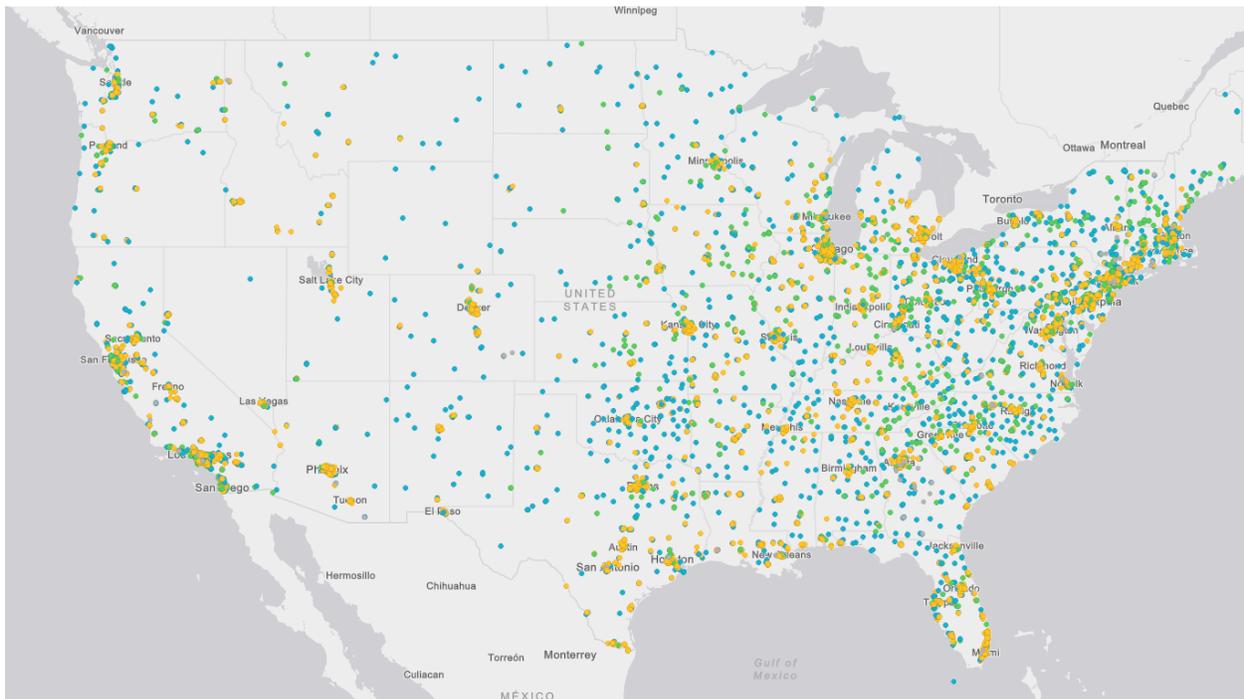## 3. Natural and Structural Migration

Based on changes internal or external to the subject and adapting Friedman's (1968) definition or natural vs. structural unemployment, we call migration caused by changes internal to the subject *natural migrations*, and those caused by changes external to the subject *structural migrations*. We treat natural and structural migrations as distinct although it is possible that a migrant is simultaneously motivated by internal and external changes, just as a migrant may respond to push as well as pull factors. Therefore, while the theoretical distinction between natural and structural migration is unambiguous, mixed motivations may obscure the differences in empirical research.

### Natural Migration
Natural migrations based on important events in people's lives are frequent and regular occurrences. Also included in the natural migrations are subjects who move out of a sense of adventure, seeking new experiences and opportunities without any obvious external event or cause to motivate their migration. Natural migrations do not signal an economic or social disequilibrium or disturbance but are movements within existing dynamic equilibria. The example of college students illustrates this point. In many college towns, every spring many graduates leave after finishing their degrees to find opportunities elsewhere. They are replaced by incoming freshmen and newly entering graduate students. This change causes no problems because institutions and markets anticipate and are accustomed to it. Housing markets easily accommodate newcomers who replace tenants who graduated and left. Traffic patterns also remain roughly the same, as does the demand for retail and other businesses.  At colleges and universities, freshmen replace those students who advanced to sophomore status, and so on. This flow of new students and graduates resembles water flowing into a basin replacing water flowing out at the other end. The water level of the basin is not significantly affected, as long as inflow and outflow are roughly the same. In other words, there exists a dynamic equilibrium and natural migration is necessary to maintain this equilibrium.

Because of these characteristics, natural migration is rarely a subject that requires significant policy intervention. Because it is a well-known and predictable process, markets, private and public organizations, and other affected institutions are accustomed to and deal with it is a matter of routine. The fact that natural migrations are widely dispersed over space also facilitates dealing with them as they are not overwhelming a small number of jurisdictions and markets with sudden and unanticipated changes. As an example, Figure 1 shows the distribution of colleges and universities in the contiguous United States. Their distribution resembles the distribution of the population over the 48 states and the regular population exchanges affiliated with college and university life are therefore also widely distributed.

**Figure 1:** Map of Colleges and Universities in the Contiguous United States



Source: https://nces.ed.gov/ipeds/CollegeMap/ (October 21, 2020)

## Structural Migration

Structural migration is a response to external change or changes that do not occur regularly and predictably. Unlike natural migration, structural migration does not maintain a dynamic equilibrium but is a response that will eventually bring about a new equilibrium. The pace of the adjustment to a new equilibrium can be fast or slow, depending on the cost of migration, the pace and nature of the event that causes the disruption, and available opportunities elsewhere. Reliable information is another factor determining the ease and speed of adjustment. For example, if workers in a struggling industry believe that they are being laid off because of a temporary downturn when the real cause is long term decline, as seems to initially have been the case in the employment decline in the steel and automotive industries in the early 1980s, they may initially not consider occupational or geographical mobility as a rational response.

In the case of natural migration the motivation to move starts with the individual, while in structural migration it is triggered by an external event. In addition, structural migrations are usually geographically constraint which concentrates the impact on an often small subset of the nation. A comparison of the maps in Figure 1 and 2 already show that because car parts manufacturers are relatively concentrated, the impact of a slow-down or decline in the car industry will also be distributed unevenly. In the case of natural disasters, the geographical concentration can be particularly great, as was the case after Hurricane Katrina in 2005.

**Figure 2:** Motor Vehicle Parts Manufacturers (2010 annual average, by county)
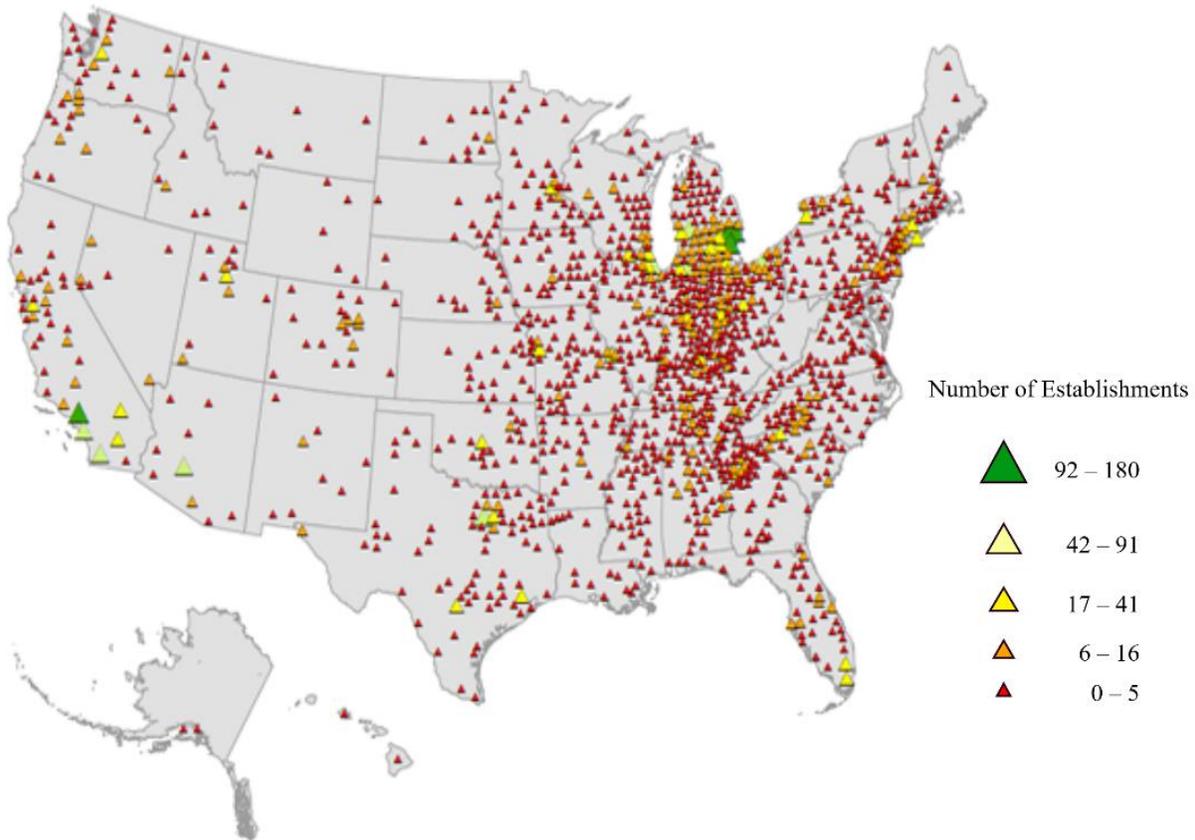


Source: https://www.bls.gov/spotlight/2011/auto/ (October 22, 2020)

A map of flood hazards, tornado frequency, earthquake risk, and other natural hazards, would show similar or even more pronounced spatial concentrations. As we will explore in the next section, changes in economic fortunes may not be as common and usually not as immediately apparent as natural disasters, but from a policy perspective they may be more challenging because they generally unfold gradually and often develop over a long time. This is exemplified in the slow decline of coal mining employment where occasional resurgence may also mislead worker into believing that the industry is recovering before the long-term trend resumes (Figure 3). Coal mining also shows that not all coal mining regions are affected equally by the decline.

**Figure 3:** Coal Mining Employment in the United States
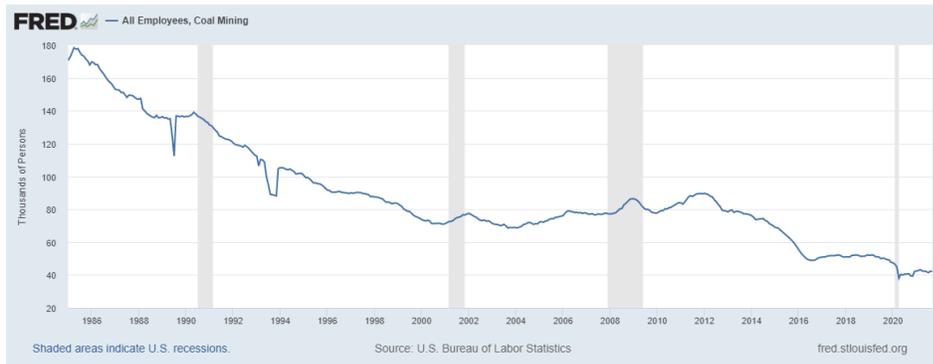


The most important distinctions between natural and structural migrations are summarized in the following table.

**Table 1:** Summary: Common Characteristics of Natural vs. Structural Migrations

|  | Natural Migrations | Structural Migrations |
|---|---|---|
| Spatial Impact | Widely dispersed; roughly proportional to population distribution | More spatially concentrated from a relatively large region (e.g., automotive belt; coastal region; earthquake region) to a small area |
| Predictability | Good with high probability because of regularity of occurrence and similarity of scale | Uncertain timing of occurrence in specific regions; scale, severity, and impacts can vary significantly between occurrences |
| Socioeconomic Disruption | None or minimal | Can have major social and economic impacts; some occurrences impact markets on a national scale |
| Policy Intervention | Routines policies and established markets and institutions are sufficient | May require emergency responses and external assistance to local and regional institutions |

## 4. Implications

The comparison of natural and structural migrations in Table 1 suggests that the former generally do not created new policy challenges and that, therefore, policy research on structural migrations should have priority over natural migrations. This should <u>not</u> be taken to mean that all structural migrations pose the same policy changes. In the case of a severe natural disaster, the policy response time may be measured in days or, in particularly extreme cases, hours. The federal government's Federal Emergency Management Agency (FEMA) has been created for such occurrences to assist local, regional, and state governments. Other countries maintain similar government agencies or may call on the military to provide support. In other words, in emergency circumstances, the federal government mobilizes extra resources and coordinates the responses to an emergency with local and state governments. In addition, while disasters may share

similarities, there are also differences in location, scale, impact, etc., that responders can consider only at the time it occurs. It is the more slowly unfolding structural migrations that are – or should be – of greatest interest to policy makers as they are likely signaling a strength or weakness of a place or region.

Structural migrations include push as well as pull migrations. The common meaning of a push or a pull is that of an external event, not one coming from the subject being pushed or pulled. In fact, push or pull migrations, or a combination of both, constitute all structural migrations as defined here. While it is possible to interpret a change internal to the candidate, such as graduation from college, as a push[2], we think that distinguishing between internal and external causes provides useful information for research and policy making. First, natural migrations are necessary to maintain equilibria, as our example of college town illustrates. Second, because their cause is internal to the subject, it is rarely an object for public policy and should, therefore, not be lumped together.   Of course, every migrant will choose from among the available options the one she considers the best. This is true even in the case of forced migration. However, if we use this point to argue that all migrations are pull migrations, the concepts become meaningless as it cannot help us distinguish between migrations. Third, push or pull migrations only make sense if their destination is final. However, some migrants move with the clear understanding that the initial destination is but a stop on the way to their ultimate target destination (Schaeffer 1985). Many professionals, for example performing artist and athletes, start their careers at less prestigious places to gain experience and become better performers. Once established, they move up in the hierarchy of prestige. Push or pull migration cannot really explain their first choice without knowledge of the ultimate destination. Since such repeat migrations are not caused by external factors, they are part of natural migrations.

If structural migrations are to be given priority for policy attention over natural migrations, how can we distinguish between them? Published mobility data do not contain information that would allow us to make the distinction. However, it may be possible to estimate structural migrations using the gravity model of spatial interaction. To illustrate this claim, consider the Lowry synthesis of the gravity model (Lowry 1966):

$$M_{i \to j} = \left(\frac{U_i}{U_j}\right)\left(\frac{W_j}{W_i}\right)\left(k\,\frac{L_i L_j}{D_{ij}}\right)$$

$M_{i \to j}$: migration from region $i$ to region $j$;
$U_k$: civilian unemployment rate in region $k = i, j$;
$W_k$: hourly wage rate in region $k = i, j$;
$L_k$: size of the nonagricultural labor force in region $k = i, j$.

In this formulation the third term can be taken to represent the potential for natural migration when there are no push or pull factors present. An alternative formulation could replace the nonagricultural labor force with population size. This would be an appropriate change if the focus is on all migrations and not only on job-related migrations. Work that built on Lowry's

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[2] My colleague Randall W. Jackson made this point in a discussion of an earlier draft of this manuscript. His comments and questions helped clarify my thinking on migration classifications. The usual caveat applies.

contributions added refinements to his model. For a review of gravity models, see Haynes and Fotheringham (2000).

The proposed approach to estimating natural migrations could be used to establish an index of expected migration and migration exceeding or not reaching that threshold, could be interpreted analogous to the extra mortality of COVID-19 or, conversely, the benefits of policy measures in reducing adverse effects. Additionally, when the rate of overall migration changes, it would be possible to discern if these changes equally affect natural and structural migrations, or if there are differences. This is of particular interest because residential geographic mobility in the United States has been decreasing slowly but steadily for over thirty years (Frost 2020).

As argued earlier, structural migrations due to a declining industry, which is a push migration, are among the most challenging policy issues because the first out-migrants are not a representative segment of the declining region's population but tend to include those best qualified for alternative employment, that is, the most skilled, trained, and educated. This makes it more difficult to address the underlying structural problem, for example, by attracting and supporting other industries to fill the void left by the declining industry. The coal industry in Appalachia provides an example of a particularly big challenge. Since many of the coal fields are located in relatively remote places, they are not favored by industries that, unlike extractive industries, can choose from among a large number of alternatives.

This results in towns with infrastructure originally built for a much larger population. McDowell county, West Virginia, provides a dramatic illustration. Its population in 1950 was almost 99,000; the U.S. Census Bureau estimated the 2019 population to be 17,624 (Schaeffer 2021). In addition to the reduced population size, the county has also a very low labor force participation rate and low education attainment. It is county in crisis and, since West Virginia also reached its population peak in 1950 and has since declined by some ten percent, the county cannot expect growth stimuli from the state. Fortunately, not all regions experiencing a declining industry face such extraordinary hardship and Pittsburgh, Pennsylvania, is an example of a town and region that has overcome employment decline in its once dominant steel industry (Giarratani and Houston 1989; Treado and Giarratani 2008).

Pull migration is less serious for several reasons, including psychological ones as people seem to feel losses more acutely than gains not realized. In addition, in pull migration, the inhabitants of a potential sending region are not or only very gradually becoming worse off unlike in the case of pull migration where job losses occur quickly and often in large numbers. While the causes and impacts of pull migration should also be addressed, we can expect the challenges to be easier and more time to address them.

## 5. Summary and Conclusions

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