



Excess churn in integrated labor markets

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Abstract

The common European labor market enhances allocative efficiency, but certain institutional features may also trigger inefficient migration. As a job in a high-income country entails generous welfare and social insurance entitlements, migrants' reservation wages may lie below their opportunity cost of labor. We show that this gives rise to an externality when employers and migrant workers can pass some of their remuneration costs onto taxpayers. Once welfare benefit entitlement is secured, the reservation wage of the migrant rises, giving the firm an incentive to replace the worker with a similar migrant willing to accept lower pay. This leads to *excess churn*—a reallocation of labor within firms that simultaneously involves a flow of employees to unemployment benefits and the hiring of similar workers. Based on Norwegian data, we present evidence of high excess churn rates in firms with many workers from the new EU member states.

Keywords Churning · Integrated labor markets · Social dumping · EU enlargement

JEL codes F22 · D62 · E24

1 Introduction

When firms hire workers, they expand employment or replace departing workers. Churn is the hires and separations that offset each other within the firm. In undistorted labor markets, churn is a productive process, whereby employers and employees separate when the value of an alternative option exceeds the value of the current match net of reallocation costs (Lazear and Spletzer 2012). When labor markets with different patterns of productivity merge, workers are allowed to flow more easily toward their best potential use (Kahanec 2013; see also Clemens 2011; Kennan 2012). In an optimal

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currency design area, factor mobility forms a key element (Mundell 1961; McKinnon 1963) as worker mobility generally will enhance social efficiency when productivity differentials and business cycles are not fully aligned across countries (Lundborg 2006; Basso et al. 2019).

The enlargements of the EU Single Market in 2004 and 2007 are typically hailed as offering new opportunities for better job matches, where Western European firms gained a new source of labor at low cost, while workers from Eastern and Central Europe could raise their productivity and wages. Thus, labor market integration represents a powerful source for improved allocative efficiency. At the same time, there is widespread political concern about “social dumping” where foreign workers are paid considerably less than comparable domestic labor, thereby putting a downward pressure on native low-skill wages and employment opportunities; see, e.g., the recent collection of papers in Bernaciak (2015). The impacts on native wages and employment vary across skill groups (Dustmann et al. 2016), and the rich are more likely to benefit than the poor, both from the change in relative labor supply and from lower prices of goods and services. However, although the distributional challenges associated with free movement of labor appear to be widely acknowledged, it is less obvious why access to cheap productive labor should represent a challenge to social efficiency.

This paper focuses on a source of potential inefficiency in integrated labor markets arising from incentives among firms and workers to engage in job matches that are short lived and followed by workers’ transition to unemployment insurance. In a simple theoretical model, we illustrate how firms can gain from substituting an incumbent foreign worker with an identical new worker when reservation wages are sufficiently low at the time of hiring, but rising over time as the worker becomes eligible for more unemployment benefits. We show that such a mechanism may be important in integrated national labor markets where not only wages but also welfare state generosity differ across countries. Here, migrants from countries with lower wages and less generous social insurance typically have low reservation wages in the rich and generous labor market at the time of hiring. When employment also grants access to welfare transfers in terms of unemployment benefits and publicly provided services, migrants may be willing to accept a low wage for a short period to qualify for entitlements in the richer welfare state. When offered a job in one of Europe’s high-income countries, the migrants’ reservation wage may be below the opportunity cost of their labor (net of migration costs). Once eligibility is attained, the reservation wage rises. This gives incentives for migrants as well as firms in rich and generous markets to form contracts where workers are laid off when they achieve unemployment benefit entitlements. At the same time, the firm hires similar migrant workers without entitlements at arrival. We label this process *excess churn*.

When laid-off workers are eligible for unemployment benefits, the host country’s taxpayers will suffer losses from excess churn of migrant labor. This effect will be strengthened by the progressive nature of many unemployment benefit systems, which typically offer particularly high replacement ratios for low-wage workers. Moreover, since a migrant’s reservation wage is likely to be lower the higher is the expected future payoff from the welfare state, ceteris paribus, firms also have a perverse incentive to recruit foreign workers with a high expected future income flow from welfare state arrangements.

We study empirically the churn of workers in Norwegian private-sector firms and document how churn interacts with the firms’ share of migrant labor. In particular, we

measure excess churn as the labor reallocation within firms that simultaneously involves the exit of employees to insured unemployment and the replacement hiring of similar workers. We find that there is more excess churn in firms with a larger fraction of the workforce made up by migrant workers from the new EU countries in Eastern and Central Europe. This pattern is even more pronounced if we treat different firms owned by the same person(s) as a single ownership cluster, suggesting that some of the concurrent hiring and firing processes take place through upscaling in one firm while downscaling in another, possibly to circumvent employment protection legislation. We add evidence on the wage structure of firms with excess churn and find that the entry wages of workers substituting for recently laid-off workers collecting unemployment benefits are significantly lower than the wages of the workers they replace. Finally, the wage premium of laid-off workers relative to new hires tends to be particularly high for migrants from the new EU member states. While these empirical patterns are consistent with our theoretical framework, the lack of a foundation for clean causal identification means that we are not in the position to test their empirical relevance directly.

Our paper relates to the literature on how social insurance design may influence the size and composition of migrant flows. More generous welfare state programs, including unemployment benefits and publicly provided services, are, *ceteris paribus*, relatively more attractive for persons who consider themselves likely to become dependent on such programs than for persons who consider themselves likely to end up on the paying side. Evidence from the USA suggests that welfare benefit generosity affects the locational choice of immigrants across states (Borjas 1999; McKinnish, 2005). The size and skill composition of migrant flows to and within Europe respond to differences in the host countries' welfare state generosity, but the effects of generosity appear to be small when compared with the effects of labor demand conditions (Pedersen et al. 2008; De Giorgi and Pellizzari 2009; Razin and Wahba 2014). Giulietti et al. (2013) find no relationship between spending on unemployment benefits (as a percentage of GDP) in EU countries and immigration from non-EU countries. In recent reviews of empirical studies, Giulietti (2014) and Giulietti and Wahba (2013) conclude that the relative generosity of social benefits in receiving nations does not appear to be an important driver of migration decisions.

The mechanism we describe in our paper shares features with the situation that arises for illegal migrants when employment is a precondition for obtaining legal status. For example, studying the 2002 Italian amnesty program, Devillanova et al. (2018) identify positive effects of the program on the employment of undocumented migrants. Although the study does not observe wages, a plausible mechanism behind the finding is that undocumented migrants reduce their reservation wage in order to get a job that in turn may grant legal status as a resident of Italy.

2 A theory of excess churn contracts

Our source of inefficient job creation and excess churn in an integrated (European) labor market relies on transferability of access to welfare state programs across countries. Taking a job in a new and richer country entails not only a new wage but also a higher level of publicly provided benefits and services. Thus, a third party (i.e., the host country's taxpayers) tops off the wage offer to a migrant provided by an

employer in the host country. As we discuss below, this will give a prospective migrant the incentive to accept a (very) low wage, potentially even below the pay associated with continued employment in the home country. However, after becoming eligible to the host country's benefits and transfers, the migrant's reservation wage rises. In some circumstances, it will be beneficial for the employer-employee pair to separate. If they terminate the contract, the foreign employee collects unemployment benefits and the employer hires a new migrant worker. This is what we call *excess churn*. When both benefits and services provided by the public sector vary considerably across countries, such excess churn and its related migrant flow involve a potentially important externality.

To discuss the conditions under which excess churn and inefficient migrant job creation arise, we present a simple two-country model. Workers and firms live for two periods. All migrants are equal, holding the option of a job in the home country with a payoff w_H , which reflects the value of work in the home country adjusted for location preferences. We ignore the choice between domestic and foreign labor. The firm decides whether to hire the same migrant for both periods (avoid turnover costs) or to have one-period contracts (with low pay) with different migrant employees. In the first period, a worker from a low-income country (the origin/home country) must pay a migration cost m if she/he migrates to a high-income country (the host country) to take a job with the wage w_1 . Through this job, the migrant becomes eligible for residency, transfers, and services from the host country's welfare state with the value A . This includes social insurances, child allowances, as well as subsidized public services like child care, health care, or education.¹ In the second period, the migrant continues to receive A , except in case of remigration. In addition, the worker either receives the wage w_2 (with continued work) or unemployment benefits B (if the job is terminated), where the latter also incorporates the value of leisure in the host country.

In the first period, the firm must pay a training cost T . The size of the training cost may be viewed as a measure for how easy it is to substitute a migrant worker for a native worker, and it is likely to vary considerably across different types of jobs, depending, for example, on language requirements.

2.1 The wage contract

For simplicity, we assume that the firms in the host country hold all of the market power, such that migrants are paid their reservation wage. The two-period reservation wage for prospective migrants is then

$$w_1 + w_2 = 2(w_H - A) + m. \quad (1)$$

Without churn, the firm hires a worker for two periods at a total compensation that covers her reservation wage. The worker receives a wage in period 2 which provides

¹ For simplicity, we assume that there are no such transfers/services in the origin country, but the important assumption is that transfers are larger in the host country.

incentive to stay with the firm. As the immigrant has become eligible for unemployment benefits at this stage, the *immigrant worker participation constraint* is simply

$$w_2 \geq B$$

We assume that the immigrant cannot commit to work in period 2 with a wage below B .² Then, the offered wage in period 1 follows by inserting $w_2 = B$ in (1);

$$w_1 = 2(w_H - A) + m - B \tag{2}$$

Note that an increase in unemployment benefits for which the migrant is entitled to in period 2 totally crowd out entry wages. The same holds for transfers and services from the host country public sector.

From the firm’s perspective, to keep the worker in period 2, it must be cheaper to pay the wage equal to B instead of hiring a new migrant at w_1 and train her at a cost T . Thus, the firm’s *no-churning constraint* is

$$w_1 + T \geq B$$

By inserting for w_1 from (2), a non-churning contract is then incentive compatible if

$$T > 2(B - (w_H - A)) - m = T^* \tag{3}$$

Thus, when training costs exceed this threshold, T^* , both parties gain from staying together and the no-churn contract is viable. The properties of the threshold are straightforward and intuitive. T^* increases in social insurance generosity (B, A) and is lowered by higher home wage (w_H) and migration costs (m).

The optimal choice of contract can also be derived by comparing profits, subject to the participation constraints. When the firm chooses to hire a migrant for two periods, the total profit over the two periods for a job with productivity e is

$$\pi^{\text{no chum}} = 2e - T - w_1 - w_2 = 2(e - w_H + A) - T - m \tag{4}$$

where the latter equality follows from the reservation wage in Eq. (2).

With churning, the two-period profit is simply productivity minus wage and training costs, multiplied by two. By inserting the wage from the migrant worker participation constraint in Eq. (2), the profit with churn reads

$$\pi^{\text{chum}} = 2(e - m - T - 2(w_H - A)) + B \tag{5}$$

Note that the unemployment benefits affect profits differently in the two regimes. For no-churn contracts, a higher B will raise the wage in period 2, but this raise will completely crowd out the wage paid in the first period leaving total wage bill and profits unchanged. With churning, however, the firm gains from the drop in entry

² With commitment, a contract with a common wage of both periods equal to $w_1 = w_2 = w_H - A + 0.5m$ would be optimal.

wages due to a higher B (as they do not pay the higher wage in period 2). When the migrant leaves the firm after one period, her income is covered by the social insurance system. It follows directly by comparing profits under the two types of contracts that no-churning is preferred by the firm if and only if $T > T^*$, as in Eq. (3).

Churning contracts will only exist if $T^* > 0$; i.e.,

$$T^* > 0 \Leftrightarrow B + A > w_H + 0.5m, \quad (6)$$

which states that $(B+A)$ must exceed a certain strictly positive value (compared to w_H). If countries are very similar in terms of productivity and social insurance institutions, the wage of the home country, adjusted for location preferences and public services and transfers, is likely to exceed the benefits provided by the potential host country. Moreover, migration costs can be prohibitive and reduce the potential for churning contracts.

2.2 Jobs and efficiency

A potential job is characterized by a combination of productivity and training costs; (e, T) . Conditional on contract type, we can define the critical zero-profit productivity levels. From (4) and (5), it follows directly that these critical levels are

$$\varepsilon^{\text{no chum}} = 0.5(T + m) + (w_H - A) \quad (7)$$

and

$$\varepsilon^{\text{chum}} = T + m + 2(w_H - A) - B \quad (8)$$

The different (e, T) regions can be illustrated as in Fig. 1. Note that the threshold T^* is independent of e . For T below the threshold, the critical productivity curve has a slope of unity as training costs must be paid in each period. As T approaches zero, the productivity must cover the reservation wage, subsidized by B .

In the no-churn region ($T > T^*$), training costs are implicitly shared between two periods; i.e., the slope of critical productivity curve is just a half. For $T = T^*$, the critical productivity levels of the two regimes coincide and are equal to B . All jobs with positive profits are given by combinations of e and T above the kinked line defined by the minimum of the two critical productivity levels.

From a global (i.e., two country) perspective, a job match is *efficient* if and only if the net productivity gain from moving workers to the generous social insurance country ($2^*(e - w_H)$) exceeds the costs in terms of migration and training ($m + T$). That is, iff

$$e \geq w_H + 0.5(m + T) = \varepsilon^* \quad (9)$$

The job creation efficiency of the two regimes can then be evaluated by comparing the minimum efficient productivity, ε^* , with the market productivity thresholds under the two alternative contracts. It follows directly that under no-churn

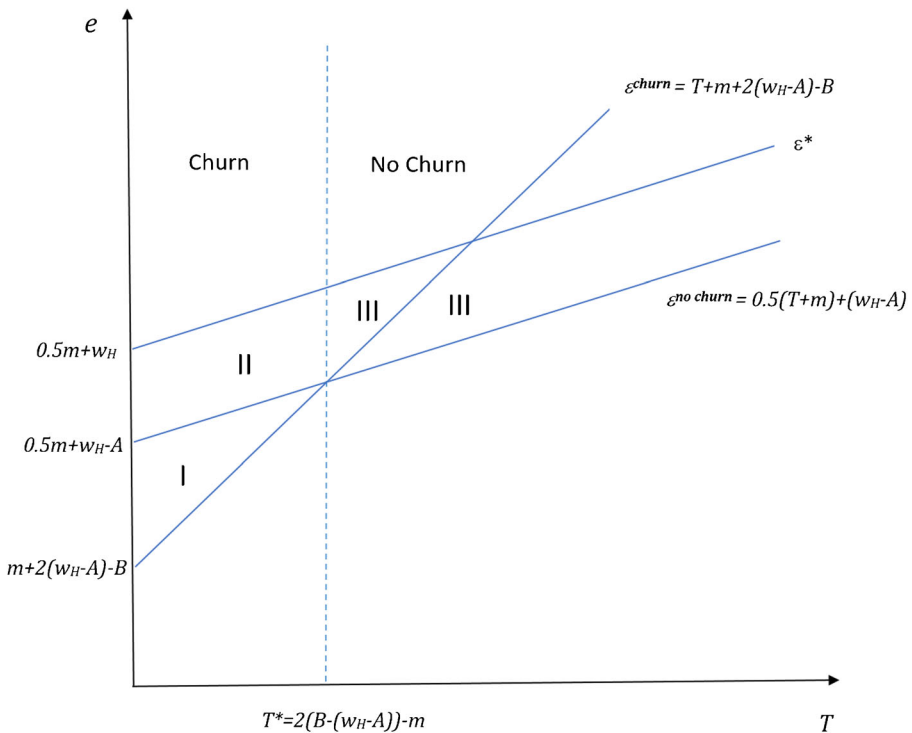


Fig. 1 Churning and efficiency across jobs by productivity and training cost

$$\varepsilon^{\text{no churn}} - \varepsilon^* = -A, \tag{10}$$

and for churn contracts

$$\varepsilon^{\text{churn}} - \varepsilon^* = 0.5(T + m) + (w_H - A) - (A + B) \leq -A \tag{11}$$

Both zero-profit productivity thresholds are below the efficient threshold in the (e, T) space in Fig. 1, illustrating that inefficient migrant jobs will exist under both types of contracts. The (generous) welfare state of the host country implicitly subsidizes low productivity job matches involving workers recruited abroad.

Without churn, jobs are subsidized with A . All the combinations of e and T in the III-region of Fig. 1 will be inefficient jobs that are profitable to domestic employers at the reservation wages of migrant workers. The productivity gap is even larger for jobs that are churned, partly because the unemployment benefits enable the firms to attract workers to a larger number of inefficient jobs. Churn represents additional waste of resources since training and migration costs are incurred in both periods. In Fig. 1, regions I and II contain inefficient jobs that are churned because firms face low training costs and gain from replacing a migrant worker after one period.

Minimum wage legislation appears to be a relevant policy to avoid subsidizing inefficient jobs and excess churning. If an employer must pay a minimum wage (ω) in each period, profits under the two types of contracts are

$$\pi^{\text{no churn}} = 2e^{-T-\omega-B}, \quad \omega \leq B \quad (12)$$

and

$$\pi^{\text{churn}} = 2(e^{-\omega-T}) \quad (13)$$

The training cost threshold with minimum wage (T^{**}) follows from equal profits; i.e.,

$$T^{**} = B - \omega \quad (14)$$

When the minimum wage is set independent of the reservation wage of the migrant, neither A , nor w_H , or m affects whether jobs are churned or not. With a binding minimum wage, higher unemployment benefits will raise the incentives for churning since the employers who keeps their worker has to raise wage. As the threshold *without minimum wage* legislation can be written

$$T^{**} = B - w_1, \quad (15)$$

it follows directly that $T^{**} < T^*$, when the minimum wage is binding. Thus, a binding minimum wage will reduce the potential for churning.

The introduction of a minimum wage will alter not only the churning threshold but also the number of profitable jobs for any given level of training costs. Even if a minimum wage raises efficiency by limiting excess churning and the number of profitable but ineffective jobs, it will also make effective non-churning jobs unprofitable.

To discuss this tradeoff, assume that the minimum wage is set to avoid excess churning such that $T^{**} = 0$; i.e.,

$$\omega = B > w_H + 0.5m, \quad (16)$$

where the latter inequality reflects the assumption of a generous welfare state in the host country. In the context of the data used in this paper, it is also supported by the evidence provided in the empirical sections below. The corresponding zero-profit curve in Fig. 2, called ε_{\min} , has an intercept of B and a slope of one-half as training costs are shared between the two periods. Profitable jobs are in the V and VI regions. The minimum wage will destroy all churning jobs and turn all profitable jobs in the V region into permanent jobs. Moreover, all (globally) inefficient jobs in regions I–III also disappear due to the minimum wage. However, efficient jobs in region IV disappear because the minimum wage raises the payoff of foreign workers above their reservation wage.³ The net effect on migration of introducing a minimum wage is unambiguously negative, but it is indeterminate whether the drop in efficient or inefficient migration dominates. The underlying distribution of (e, T) jobs will be decisive.

Throughout this section, we have for simplicity specified the utility of unemployment in terms of a fixed parameter B . In practice, most unemployment benefit systems

³ Note that region IV is empty if $\omega = B = w_H + 0.5m$.

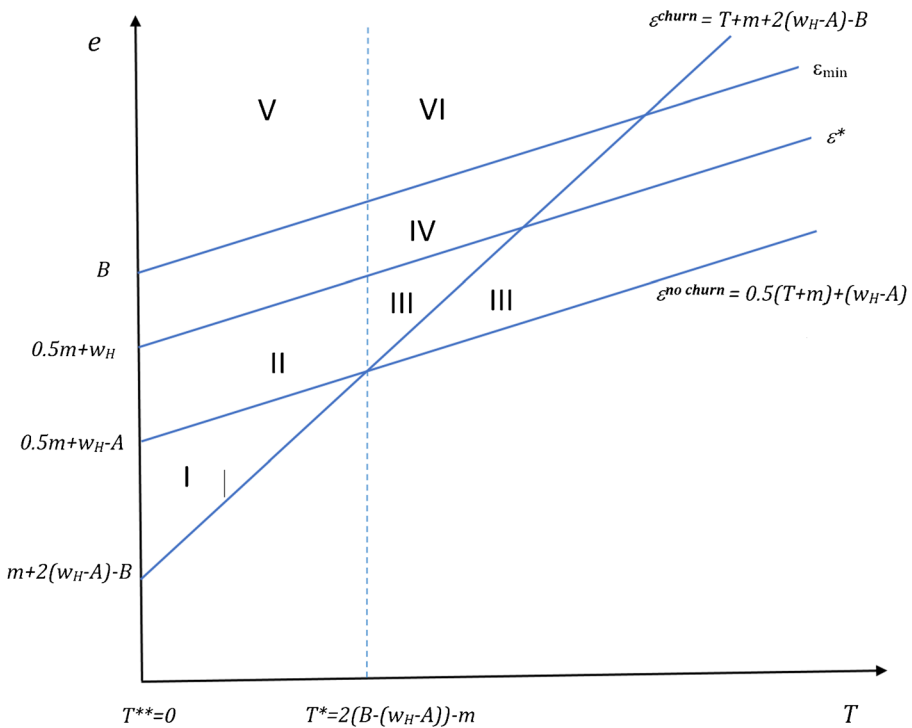


Fig. 2 Profitable and efficient jobs under minimum wage equal to B (no churning)

provide a compensation level which is linked to pre-unemployment labor earnings. The utility of unemployment in the second period could then be specified as

$$B = \alpha w_1 + b$$

where both α and b are positive. Although the model becomes considerably more complicated, the central predictions remain unchanged. In the absence of a minimum wage, the wage in the first period now reads

$$w_1 = \frac{1}{1 + \alpha} (2(w_H - A) + m - b) \tag{17}$$

and the training cost threshold can be written

$$T^* = \frac{2b}{1 + \alpha} - \frac{1 - \alpha}{1 + \alpha} m - 2(w_H - A) \left(\frac{2}{1 + \alpha} - 1 \right) \tag{18}$$

which is equal to the expression above for $\alpha = 0$. T^* is increasing in both b and α .

In terms of empirical patterns, the model outlined in this section provides a number of predictions: (i) host country jobs with low country-specific qualification requirements (e.g., language skills) are subject to considerable migration as well as excess churn; (ii) jobs with medium qualification requirements are subject to migration, but

largely without churn; (iii) jobs with high country-specific qualification requirements are subject to little migration; and (iv) recently arrived migrants are paid low wages relative to natives and migrants already in the host country. In practice, many rich countries have enacted regulations designed to offset the externalities highlighted in this model, e.g., in the form of minimum wages and employment protection legislation. We return to the possible roles that such policies can play after having presented our empirical analysis.

3 Institutional setting: the European labor market and immigration to Norway

Although Norway has stayed outside the European Union, the participation in the European Economic Area (EEA) ensures that the EU principle of free movement of labor applies even in Norway. The EU enlargements in 2004 and 2007 have been the source of rapid change in the composition of the Norwegian workforce. As illustrated in Fig. 3, the share of new EU migrants in private-sector employment grew from less than 1 percent in 2005 to close to 10 percent in 2016.

The EU principle of free movement of labor entails not only that employment can be sought anywhere in Europe but also that a number of social insurance and family allowance entitlements are automatically transferred to the country of current or most recent employment. In the case of Norway, this implies, for example, that when a person from another EEA country obtains employment, the worker immediately becomes covered by the Norwegian unemployment benefits program, provided that

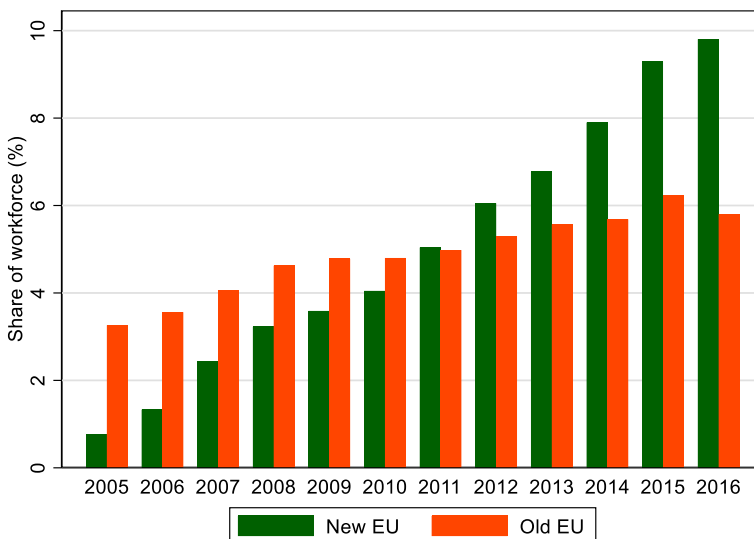


Fig. 3 New and old EU migrant shares of the Norwegian private-sector workforce, 2005–2016. Note: Migrant shares pertain to private-sector workforce as of Dec 31. Workforce is restricted to wage earners at least 20 years of age and not enrolled in school. “New EU” countries include workers from (in order of size of migrant stock) Poland, Lithuania, Romania, Latvia, Slovakia, Estonia, Bulgaria, Hungary, Czech Republic, and Slovenia; “Old EU” covers workers from Sweden, Germany, Denmark, UK, Finland, Iceland, Netherlands, France, Spain, Italy, Portugal, Greece, Ireland, Austria, Belgium, and Luxembourg

their prior employment history *would have* ensured eligibility had the same employment history been accumulated in Norway. In the calculation of unemployment benefits entitlement, earnings from the home country are converted to Norwegian wages (hours worked at home are multiplied by the typical Norwegian wage for similar work). In the absence of a home-country employment history, unemployment benefits entitlement in Norway will in any case be achieved once earnings in Norway during a previous calendar year exceed a relatively low threshold.⁴

Migration to a job in Norway also entails immediate eligibility to various family allowances. For families with children, this implies that a job in Norway may be attractive even when the offered wage is extremely low. For example, in 2019, the Norwegian cash-for-care subsidy for a one-year-old child amounts to NOK 7500 per month, which is well above the minimum wage in Poland (around NOK 5200). According to EU regulations, these transfers are also exportable, implying that they can be claimed and used by family members remaining in the home country. To illustrate the potential role of unemployment benefits for migration decisions and churn incentives in the period covered by the present empirical analysis, in Table 1, we display the average earnings and benefit levels actually obtained for various migrant groups in Norway in 2010, as well as some illustrative corresponding numbers for non-migrants. We distinguish between the new Eastern European EU countries that joined through the EU enlargements in 2004 and 2007 (“New EU”) and the Western European countries that were already in the union (“Old EU”). A first point to note is that for migrants from the Old EU countries, the monthly earnings obtained in Norway are somewhat higher than average earnings obtained in their home countries, but that the differences are moderate. And for those who become unemployed in Norway, Norwegian unemployment benefits are considerably below average pay in their home country. For workers from the new EU countries in Eastern Europe, the picture is very different. Their wage in Norway is roughly five times that in the home country, and even Norwegian unemployment benefits typically exceed the average wage in the home country by an order of magnitude.

Even though migrants from the New EU countries tend to have much higher earnings in Norway than at home, their earnings are on average well below earnings of natives and migrants from the Old EU. This may to some extent be explained by differences in human capital characteristics. Yet, it may also reflect the lower reservation wage of New EU migrants, given their much poorer earning alternatives back home. Note, however, that the wages offered in Norway are likely to exceed many workers’ reservation wage for the reason that there are industry-specific minimum wages negotiated by the associations of employers and employees. And these minimum wages have typically been explicitly motivated by the high rates of labor migrant employment in the industries in question.

With such large differences in unemployment benefits across source countries, we might expect to see different patterns of unemployment benefit claims across migrant groups. To study this, we follow Bratsberg et al. (2014) and examine the patterns of unemployment incidence among labor migrants from the New and the Old EU who entered Norway following the 2004 enlargement of the union. Figure 4 shows the

⁴ The threshold is 1.5 times the base amount of the social security system (about €15,000) and corresponds to approximately 25% of average full-time/full-year earnings in Norway.

Table 1 Unemployment benefits and average earnings at home and in Norway, immigrants from new and old EU member states, 2010 (Euros)

	At home		In Norway				Number of observations in col. (5)
	Monthly UI benefits (1)	Monthly wage income if employed (2)	Monthly UI benefits among claimants (3)	Monthly pay, wage earners (4)	Monthly earnings (5)	(6)	
New EU							
Latvia	411	684	1709	3390	3191	27,780	
Lithuania	188	561	1580	3210	3111	3792	
Poland	223	860	1715	3379	3160	19,796	
Romania	144	453	1937	3660	3497	1158	
Old EU							
Denmark	2188	4208	2064	5748	5203	1070	
Germany	1249	3478	1962	4368	4048	4945	
Netherlands	2826	3768	1640	5393	4474	931	
Sweden	1546	3220	2111	4736	4412	4707	
Norway	2947	4909	1899	4934	4616	1,302,245	

Note: Source of entries in columns 1 and 2 is OECD iLibrary, OECD Social and Welfare Statistics, benefits are for single worker with no children. Benefits and wages are converted to Euros using average exchange rates for 2010. Entries in columns 3–6 are authors' calculations based on the register data used in the empirical analyses below. The migrant sample consists of private-sector workers age 20 plus, not enrolled in school, and who immigrated between 2005 and 2008; native sample is reweighted to match the age distribution of the migrant sample

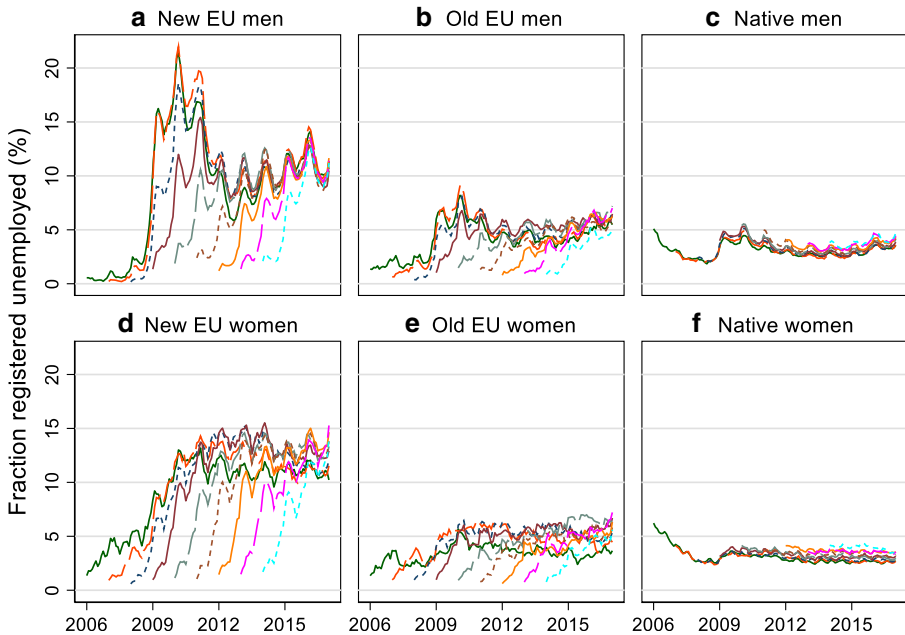


Fig. 4 a–f Monthly registered unemployment rates (as percent of population), January 2006–January 2017, 28th of each month, by gender, source region, and year of immigration. Note: Migrant samples are restricted to those aged 18–47 at entry and in the country Dec 31 each calendar year. Native curves are drawn for successive cohorts age 30 the first year depicted

monthly rate of unemployment benefit claims for European labor immigrants to Norway who arrived after May 1, 2004, and who remained in the country at the end of each calendar year. It is evident that, since the financial crisis of 2008, migrants from the New EU countries have been consistently overrepresented among unemployment benefit claimants, both relative to migrants from the Old EU and relative to natives. Considering Figs. 3 and 4 together, it is clear that high and rising unemployment among *previous* labor migrants have coincided with high inflows of *new* labor migrants.

The Norwegian unemployment benefit system is designed to protect workers from *involuntary* job loss; hence, it is in principle not possible to quit a job voluntarily in order to claim benefits. Most unemployment benefit claims are therefore triggered by layoffs or by the termination of temporary contracts. Employment protection legislation implies that layoffs must be justified, either as resulting from some form of individual misconduct or from the need for downsizing. At the same time, the use of temporary contracts is regulated and only allowed for tasks that are genuinely temporary of nature.⁵ Taken together, these institutional features suggest that the scope for excess churn is very limited, and even forbidden, insofar as it entails the simultaneous firing and hiring of workers to what is essentially the same job. There are, however, numerous ways to circumvent these regulations, and the control mechanisms are not always

⁵ In 2015, this regulation was modified, allowing Norwegian employers to hire workers on a temporary contract for up to one year. However, it is not allowed to replace the worker with a new temporary hire when the contract expires.

effective. Also, by organizing a single economic activity into multiple firms, it is possible to downsize in one firm while upsizing in another. Hence, when we turn to the empirical analysis of churn, it becomes essential to identify firms that belong to the same owners.

4 Churning

In this section, we examine empirically worker flows in and out of Norwegian private-sector firms, with particular focus on whether immigrants from new and old EU countries are more or less likely to work for employers with high rates of excess churn. Our analysis is based on complete administrative register data for the 2006–2016 period, combining information about employment spells, worker characteristics, firms, and ownership structures. Before we describe the data in more detail, we explain how we define our key churn measures.

4.1 Churn measures

Let H_t and S_t denote the number of hirings and separations at the firm level during a calendar year t . H_t is (new) workers not yet with the firm at the end of $t-1$, and S_t denotes (previous) workers who left the firm during period t . The standard measure of churn (C_t) is the smaller of the two;

$$C_t = \min[H_t, S_t]. \quad (19)$$

When $H_t > S_t$, the business expands and the churn equals the part of H_t used to replace departing workers (S_t). Even contracting businesses commonly hire workers and when $0 < H_t < S_t$, churn is given by the replacement hiring (H_t).

Workers who separate go to a new job, enter unemployment, or leave the labor force. We focus particularly on separations followed by an unemployment spell (hereafter S_t^{UI}) as these from the perspective of the employee typically will be layoffs or involuntary quits (e.g., the termination of a temporary contract). In most businesses, we expect to see few hirings when $S_t^{UI} > 0$, because worker replacement is costly due to hiring and firing costs (such as recruitment and training expenses). In most developed countries, labor regulations limit the opportunity for firms to engage in concurrent layoff and hiring of workers with similar qualifications. However, as discussed in section 2, if migrants are willing to work for low pay at the time of entry and regulations are hard to enforce, we might observe that firms hire workers and lay off workers for unemployment during the same time period. We define this excess (or “throwaway”) churn as

$$C_t^{\text{excess}} = \min[H_t, S_t^{UI}] \leq C_t. \quad (20)$$

The excess churn rate is always lower than the ordinary churn rate simply because not all separations are layoffs ($S_t \geq S_t^{UI} \geq 0$). We may find excess churn in expanding ($H_t > S_t$), contracting ($H_t < S_t$), and stable firms.

When an owner controls more than one firm, the owner can effectively churn by reducing the staff in one unit and scale up in another. Production can be divided into firms that *appear* to be independent. In a cluster of G firms, we have an aggregated churn defined as

$$C_t = \min[H_t, S_t] \geq \sum_{g=1}^G \alpha_g \min[H_{gt}, S_{gt}] \quad (21)$$

where α_g is the (initial) employment share of firm g . The aggregated churn captures reallocation of similar labor across units. By looking at each firm in isolation, the (weighted) churn is always lower than the churn calculated for the whole cluster. Considering each firm independently, churn will be zero when some units are expanding while others are contracting without replacement. To illustrate, assume that the owner runs two firms. By expanding through hiring in one firm and contracting through firing in the other, there is no churn at the firm (g) level. Taken together, however, the owner churns by reallocating labor from one firm to the other.⁶ Thus, when activities are split into different firms, empirical measures of single entities will not capture the churn that actually takes place by reallocation across firms.

A similar aggregation issue arises when firms employ different skill groups (ignoring ownership clusters for the moment), although this will tend to inflate our measure of churning. Technological change or demand shocks may give rise to a new optimal skill mix. Even for constant employment, hiring and firing due to skill mix change will appear as churn at the firm level.⁷ To illustrate, if a firm hires two skilled workers and lays off two unskilled workers, $C_t = 2$. The group-based churn rates, however, are both zero. Our data allow us to check the extent to which ignoring reallocation across skill groups actually contributes to upward biased measures of churn and, more importantly, has implications for our coefficients of interest.

4.2 Empirical measures and descriptive statistics

Our employer-employee data cover all private-sector firms on an annual basis from 2006 to 2016 and include a rich set of firm and worker characteristics.

For each firm, we have encrypted personal identifiers for owners and chief executives, the industry affiliation, and some basic characteristics. Table 2 provides an overview of the firm data used in this paper. A firm may consist of several production plants or establishments. In total, we have 239,180 firm-by-year observations.⁸ A rather unique feature of our data is that we are able to identify the ultimate owners and chief executives of all firms, facilitating analyses of ownership clusters. We define an ownership cluster (OC) as two or more firms that belong to the same majority owner (or a group of owners). Majority is defined as controlling more than one-third of both firms. To be an OC in our data, the firms operate in the same year and in the same geographical region and have the same 1-digit industry classification. By this

⁶ The same logic applies to industry-level data, as these will include churn due to expansion in some and contraction in other firms.

⁷ As noted by Lazear and Spletzer (2012), churn can also be defined at the skill (or job) level.

⁸ We limit the analysis to units with at least 10 employees.

definition, we end up with a data set with 187,416 OC-by-year observations. Even though change in ownership will inflate the count,⁹ the aggregation into ownership clusters reduces the number of employers by about 20 percent when compared with the firm-level data. About 16 percent of OCs are multi-firms and more than one-third of all firms belong to a multi-firm OC. Hence, the phenomenon that owners organize their economic activity in multiple firms may be of empirical importance. For this reason, in our empirical analyses, the observation unit is the ownership cluster, although we present certain descriptive statistics for firms. While we are primarily interested in OCs consisting of firms with similar business activities, potentially facilitating excess churn, it is of course possible that OCs reflect a purpose of diversification, i.e., that some owners wish to invest in companies that are subjected to different (possibly opposite) business cycle fluctuation patterns. The data indicate, however, that most OCs consist of firms that are similar, in the sense that they belong to the same 2-digit industry. For example, for the clusters consisting of exactly two firms, these firms are in the same 2-digit industry in approximately 70 percent of the cases (statistic not reported in the table).¹⁰

For workers, we know the identity of all employees at the start and the end of each year. We extract data on origin country, gender, age, education, wages, earnings, and all UI claims made during each year from the central population register, the national education database, and the registers of the welfare administration (“NAV”).

Job flows are measured on an annual basis. Separations are the workers employed at the end of year $t-1$ who are not working for the employer (firm or OC) by the end of year t . Likewise, hirings are persons working for the employer by the end of year t , but not twelve months earlier. In Table 2, we report the churn rates, measured relative to the number of employees at the end of year $t-1$. The overall annual churn rates vary around 10 to 12 percent of initial employment, depending on whether we study individual firms or OCs or whether or not we weight the churn rate by the initial firm size.

The excess churn is based on separations with transitions into unemployment insurance. Administrative employer-employee data rarely contain information on why workers and employers separate. For this reason, we combine employment spell information with data for unemployment spells. If the worker who separated from the firm turns up in the unemployment register during the same year (following the separation event), we count the worker as belonging to the subset S_t^{UI} of the initial workforce. Thus, excess churning may reflect that the number of workers who enter unemployment insurance is larger or smaller than the number of new hires.

Table 2 reveals that the average excess churn rate in our data lies between 1.4 and 1.6 percent, depending on whether we consider firms or ownership clusters, or weight observations by the size of the workforce. In a majority of firms and OCs, the annual rate of excess churn is actually zero; i.e., these firms and owners do not simultaneously

⁹ Fully 32 percent of the firms in our data set experienced change in ownership cluster at some point during the 11-year data window.

¹⁰ Had firms been matched randomly, this number would have been 19 percent.

Table 2 Firms, ownership clusters, and churn rates. Private sector, 2006–2015

	Firms		Ownership clusters	
	(1)	(2)	(3)	(4)
Fraction of firms in cluster				
Single firm	0.781	0.656	0.781	0.837
2	0.115	0.179	0.115	0.114
3	0.035	0.065	0.035	0.028
4+	0.070	0.100	0.070	0.021
Churn				
Mean	0.1159	0.1020	0.1207	0.1055
Median	0.0893	0.0667	0.0931	0.0778
P90	0.2494	0.2632	0.2535	0.2500
Excess churn				
Mean	0.0155	0.0140	0.0161	0.0150
Median	0.0046	0	0.0062	0
P90	0.0435	0.0548	0.0443	0.0588
Weighted by firm/cluster workforce	Yes	No	Yes	No
Observations	293,296		229,872	

hire new workers and lay off existing workers who then end up receiving unemployment benefits. This suggests that only a small fraction of the workforce experiences excess churn. However, in some firms and OCs, excess churn occurs at a rather considerable scale, as reflected by the 90th percentile excess churn rates between 4 and 6 percent of workers reported in Table 2.

There also appears to have been a moderate rise in excess churn over time (see Fig. 5). While Norway experienced an economic boom in 2006–2008, the financial crisis was responsible for a considerable slowdown in 2009, followed by a moderate recovery in the subsequent years and then a new moderate slowdown from 2013.

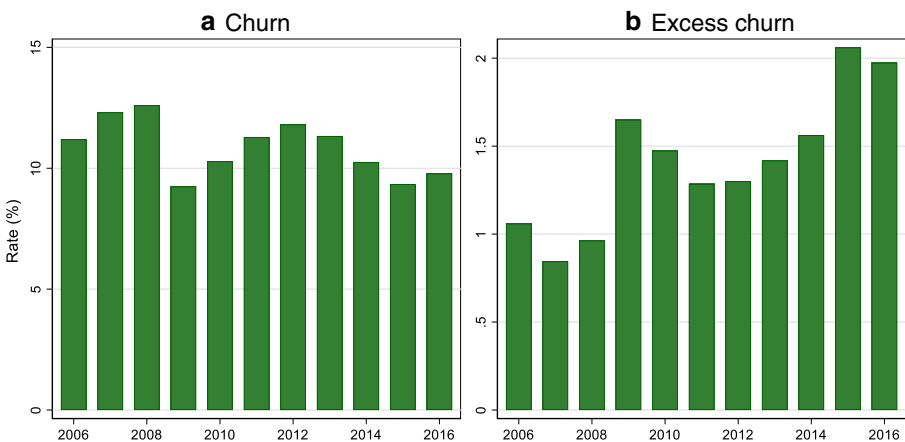


Fig. 5 a, b Churn rates 2006–2016. Note: Figure shows fraction of jobs Dec 31 prior year that are churned during the calendar year

Hence, what comes out of Fig. 5 is that the overall churn rate appears to be pro-cyclical while the excess churn rate is counter-cyclical. A probable explanation for the latter is that churned workers to a larger extent will be offered a new job in good times, such that fewer job losers will be granted unemployment benefits and thus counted as part of our excess churn statistic. Over time, there appears to have been an upward shift in excess churn. This trend is consistent with an increasing number of migrants holding temporary and short-lived jobs followed by insured unemployment spells, as suggested by our theoretical model.

5 Churn and the labor migrant workforce

While the average rates in Fig. 5 are suggestive evidence of migration as a driver of excess churn, we now look into the pattern of churn across employers. In particular, we build on a regression analysis where we quantify any systematic association between the use of foreign labor and the degree of excess churn. Based on the theoretical reasoning and the description of institutional characteristics of the European labor market in the previous sections, our key hypothesis is that employers with a high share of migrant workers—particularly from the New EU countries—also practice more excess churn. In light of our theoretical discussion, we also expect that the degree of excess churn is negatively correlated with the level of training costs.¹¹

Our regressions are not to be interpreted within a treatment effect framework. We do not claim that a higher share of migrant labor in the firm *causally* affects the excess churn rate. Both these variables are chosen simultaneously by the firm. The exercise is rather to assess whether the empirical patterns of worker turnover are consistent with a model where foreign workers and domestic employers engage in contracts that involve excess churn.

We start out by regressing the annual churn rates within ownership clusters on the fraction of initial employees that are migrants from new or old EU countries. In all regressions, we control for the size of the initial workforce, the calendar year, and the share of workers in high-skilled occupations. In addition, we control for OC fixed effects.¹² In the baseline version of the model, the regressions thus take the form

$$y_{jt} = \beta_1 N_{jt-1} + \beta_2 \text{NewEU}_{jt-1} + \beta_3 \text{OldEU}_{jt-1} + \gamma \text{HighSkill}_{jt} + \mu_j + \tau_t + \varepsilon_{jt} \quad (22)$$

where the outcome y_{jt} is either the churn or excess churn rate in year t in ownership j as defined above, in both cases relative to the number of employees at the end of year $t-1$ (N_{jt-1}). The variables *NewEU* and *OldEU* are the *shares* of employees from new and old EU member countries at the end of year $t-1$, while *HighSkill* measures the share of the workforce in occupations requiring some college education.¹³ The terms μ_j and τ_t denote ownership and observation year fixed effects.

¹¹ Ideally, we would like to distinguish skills that are particularly relevant for migrants like (Norwegian) language skills, but such information is not available at the firm level.

¹² The working paper version of this article presents results from analyses at the firm level (Bratsberg et al. 2019).

¹³ To circumvent missing education data for many migrant workers, we classify 4-digit occupations by whether the mode educational attainment of native workers involves some college.

Table 3 Churn, excess churn, and the labor migrant workforce

	Observed churn rate		Weighted across skill groups	
	Churn (1)	Excess churn (2)	Churn (3)	Excess churn (4)
New EU share	-0.074*** (0.014)	0.019*** (0.005)	-0.086*** (0.013)	0.016*** (0.005)
Old EU share	-0.009 (0.034)	-0.008 (0.005)	-0.014 (0.033)	-0.009* (0.005)
Share high-skill occupations	-0.004 (0.015)	-0.012*** (0.003)	-0.004 (0.014)	-0.013*** (0.003)
Sample mean	0.121	0.016	0.095	0.013

*/**/**Significant at 10/5/1 percent level. Standard errors, clustered within ownerships, are reported in parentheses. In columns 3 and 4, churn rates are computed separately for workers with high and low educational attainment and then reweighted together within ownership clusters. Regressions control for size of ownership cluster and year of observation, and are estimated with ownership fixed effects (62,680). Regressions have 229,872 (ownership-by-year) observations and are weighted by ownership workforce

Table 3 contains the main results from this exercise, with ordinary and excess churn rates used as the dependent variables. First, when we account for time-invariant characteristic of the ownership cluster, clusters with many migrant workers tend to have lower ordinary churn rates than clusters with few migrant workers (see column 1). The negative association is particularly strong for migrants from the new EU countries, with the overall churn rate being lower the higher is the fraction of new EU workers in the initial workforce. The strong negative association for workers from new EU countries likely reflects that there are fewer attractive options in the Norwegian labor market for new EU migrants and therefore fewer job switches triggered by better alternatives when compared with native workers or migrants from old EU countries (Barth et al. 2012).

When we consider the excess churn rate, we find an empirical pattern that is very different from that of ordinary churn. As column 2 shows, there is a statistically significant, positive association between the excess churn rate and the workforce share of migrants from the new EU countries. A ten percentage point increase in the fraction of migrants from the new EU countries in the cluster goes hand in hand with a 0.19 percentage point increase in the rate of worker churn involving subsequent UI claims, or 12 percent of the sample mean. On the other hand, we find no indication that excess churn relates positively to the share of workers from countries that were members of the EU before 2004.¹⁴

As discussed above, the measure of excess churn based on the overall employer workforce will tend to exaggerate the churn rate if there is change in the skill mix of the

¹⁴ In auxiliary analyses, we added to the regression an indicator for whether the OC consists of more than one firm as well as interactions between this variable and the initial fractions of old and new EU employees. The regression results presented in Appendix Table 7 show that multi-firm OCs have both higher overall churn rates and higher excess churn rates than single-firm OCs.

workforce. To see whether this may drive our results, in columns 3 and 4, we redefine churn such that it only captures simultaneous hiring and firing within a given occupational skill group, and compute OC level churn rates by weighting the churn rates of those in occupations that do and do not require at least some college education by their respective fractions of initial employees. First, we see from Table 3 that, when weighted across skill groups, both churn measures are reduced in size when compared with those based on the overall workforce, although differences are small. For example, the average excess churn rate across OCs drops from 1.6 to 1.5 percent. Second, and more importantly, the positive correlation between the New EU share and the excess churn rate is just slightly modified (see column 4).

Moreover, when we study excess churn by occupational skill, as in Table 4, excess churn is considerably lower for workers in high-skill occupations, consistent with higher turnover costs when compared with low-skilled workers. The association between the fraction of new EU migrant employees and excess churn is, however, the same across skill groups and comparable to that based on the overall workforce. Therefore, we conclude that secular change in the skill mix of workers is not the driver of the empirical association between excess churn and employment of migrant labor from the new EU countries.

Our theoretical framework highlights that the incentive to churn will be hampered by training costs. In particular, excess churn will be lower when it is costly for the firm to substitute an experienced worker with a new employee. Information on training costs are not available in administrative payroll records, but drawing on auxiliary firm survey data, we are able to predict training costs for the firm.¹⁵ Because we have just one observation of (predicted) training costs per employer, the coefficient of training costs is not identified with ownership fixed effects in the model. The results based on more restrictive regression specifications are presented in Table 5. Even if this means that the empirical associations between ordinary churn rates and migrant shares likely are positively biased,¹⁶ the exercise provides suggestive evidence on the role of training costs. As the table shows, both types of churning are significantly lower in OCs with high training costs. High training costs are associated with a reduction of the excess churn rate of about 0.007, which is about 50 percent of the mean value in the skill-weighted data. The association between the share of new EU migrants and excess churn drops slightly when we include training costs in the model, but remains positive and statistically significant. There is, however, no indication that the association differs between ownership clusters with high and low training costs. Although the level of excess churn is lower in clusters with high training costs, the baseline statistical associations between migrant employment and excess churn remain significant when

¹⁵ These analyses draw on the 2012 Norwegian Worker and Employer Survey (“2012 ABU”), which gives information about whether new employees undertake training and whether it takes at least 3 months to train the main occupational group of the firm. In the prediction model, we regress the firm’s survey response on its share of high-skilled workers and its 2-digit industry classification in order to predict training costs for the full set of firms.

¹⁶ In the working paper version of this article, we show that the association between the migrant share and ordinary churn flips sign when we account for ownership fixed effects (Bratsberg et al. 2019). The intuition is that migrants are more likely to find employment in segments of the labor market with high rates of ordinary churn, but, once employed (and as Table 3 showed), are less likely to churn than native workers as they face fewer attractive outside options.

Table 4 Churn and excess churn within low- and high-skill occupations

	Low-skill workers		High-skill workers	
	Churn (1)	Excess churn (2)	Churn (3)	Excess churn (4)
New EU share	-0.072*** (0.015)	0.017*** (0.004)	-0.045*** (0.012)	0.018*** (0.004)
Old EU share	-0.009 (0.025)	-0.008* (0.004)	0.018 (0.032)	-0.004 (0.005)
Share high-skill in ownership cluster	0.047*** (0.014)	-0.008*** (0.003)	-0.076*** (0.018)	-0.005* (0.003)
Sample mean	0.114	0.018	0.114	0.010
Observations	228,297	228,297	206,194	206,194
Fixed effects	Ownership (62,296)	Ownership (62,296)	Ownership (57,691)	Ownership (57,691)

*/**/***Significant at 10/5/1 percent level

Note: Standard errors, clustered within ownerships, are reported in parentheses. Regressions control for size of ownership cluster and year of observation. Regressions are weighted by ownership workforce

we allow for interactions with training costs while the coefficients of the interaction terms are statistically insignificant.

Table 5 Training costs and churn in ownership clusters

	Churn			Excess churn		
	(1)	(2)	(3)	(4)	(5)	(6)
New EU share	0.069*** (0.008)	0.051*** (0.007)	0.047*** (0.011)	0.024*** (0.002)	0.022*** (0.002)	0.023*** (0.003)
Old EU share	0.185*** (0.011)	0.166*** (0.011)	0.214*** (0.019)	0.014*** (0.002)	0.012*** (0.002)	0.010*** (0.003)
Share high-skill occupations	-0.053** (0.007)	-0.012** (0.006)	-0.011** (0.006)	-0.022*** (0.001)	-0.017*** (0.001)	-0.017*** (0.001)
High training costs		-0.064*** (0.004)	-0.058*** (0.004)		-0.007*** (0.001)	-0.007*** (0.001)
High costs			0.017 (0.012)			-0.003 (0.004)
*New EU share						
High costs			-0.124*** (0.021)			0.005 (0.004)
*Old EU share						
Sample mean	0.095	0.095	0.095	0.013	0.013	0.013

*/**/***Significant at 10/5/1 percent level

Note: Standard errors, clustered within ownerships, are reported in parentheses. Dependent variable is weighted across workers in different occupational skill groups. Regressions have 229,872 observations and control for 1-digit industry, size of ownership cluster, and year of observation. Regressions are weighted by the ownership workforce

6 Wage differentials between new hires and laid-off workers

Our theoretical setup predicts that replacement hires involved in the process of excess churn are paid low wages when compared with the (now unemployed) workers they replace, particularly if they are labor immigrants. To examine this empirically, we next focus on employees who are involved in excess churn within ownership clusters; i.e., we compare the last observed wages earned by the laid-off workers with the first observed wages received by the new workers in the same (4 digit) occupation and the same ownership clusters. We estimate the following wage equation separately for native workers and the two groups of migrant workers from the old and new EU;

$$\ln W_{ijot} = \tau + \delta \text{Newhire}_{ijot} + \theta (\text{Newhire}_{ijot} + \text{SeparatetoUI}_{ijot}) + \eta_{jot} + \xi_i \quad (23)$$

where W_{ijot} is the weekly wage of worker i in ownership cluster j , occupation o , and year t . The variable *Newhire* is an indicator for recently hired workers and *SeparatetoUI* is an indicator for workers who are laid off during year t and collect unemployment benefits. Since the new workers' wages are observed at a later stage than for those laid off, we inflate the wage of laid-off workers using the general wage growth during the year in question. Our parameter of interest is δ , i.e., the conditional wage differential between newly hired workers and laid-off workers who collect UI benefits. This parameter is estimated within annual ownership-by-occupation clusters (η_{jot}), keeping continuing workers in the regression sample in order to estimate the large number of fixed effects.

As noted above, our measure of excess churn not only incorporates the socially inefficient process of simultaneously hiring and firing similar workers in order to exploit differences in reservations wages generated by social insurance institutions, it is also likely to incorporate elements of efficient skill composition restructuring and the dissolution of poor matches. In general, we may expect persons who become unemployed to be negatively selected in terms of productivity and thus to have had lower wages than other workers, *ceteris paribus*. Hence, what we are primarily looking for in this exercise is whether there is a particularly large wage differential between incoming and outgoing labor migrants.

The regressions results are presented in Table 6. They show indeed that when we control for individual human capital characteristics (age and education) and compare workers in the same occupation and in the same ownership cluster, there are considerably larger negative wage differentials between new hires and laid-off migrant workers than for natives. The differential is particularly large for workers from the new EU countries. According to the estimate in column 2, a new hire from a new EU country is paid 5.4 percent less than a similar migrant worker (same country, same occupation, and same owner) on the payroll last year and now collecting UI benefits. Even for migrants for old EU countries, new hires are paid less than those who leave and receive UI benefits. In other words, newly hired migrant workers are paid significantly below departing workers now collecting UI benefits, consistent with prediction that incentives for excess churn are particularly strong in matches involving migrant workers.

Table 6 Wage differentials between new hires and laid-off workers on UI within ownership clusters and occupations

	New EU		Old EU		Natives	
	(1)	(2)	(3)	(4)	(5)	(6)
New hire	-0.057*** (0.013)	-0.054*** (0.019)	-0.060*** (0.016)	-0.044** (0.019)	0.028*** (0.006)	-0.012** (0.005)
Observations	322,832	284,721	319,585	234,474	8,464,226	7,610,608
Fixed effects	Owner ^{***} year (38,655)	Owner ^{***} year*occupation (45,030)	Owner ^{***} year (47,690)	Owner ^{***} year*occupation (51,183)	Owner ^{***} year (246,111)	Owner ^{***} year*occupation (771,432)

*/**/***Significant at 10/5/1 percent level

Note: Samples are restricted to private-sector wage earners age 20+ and not enrolled in education. Standard errors, clustered within ownerships, are reported in parentheses. All regressions include an indicator variable for new hire or UI recipient on last year's workforce. Columns 2, 4, and 6 control for gender, age and its square, and educational attainment

7 Policy implications

It has been argued that the pre-enlargement fears of free labor mobility already have been proved unjustified. Kahanec (2013), for example, asserts that “no significant detrimental effects on the receiving countries’ labor markets have been documented, nor has there been any discernible welfare shopping” and concludes that “the free movement of labor in an enlarged EU can with little doubt be considered a success story of EU integration and enlargement.” Even if free movement of labor represents a huge potential for improved allocative efficiency and is an important source for social cohesion in Europe, our study suggests that the story is more complicated in the case of the most recent EU enlargements.

Our empirical evidence shows that firms and ownership clusters with many immigrant employees from the new EU countries are more likely to simultaneously hire and fire similar workers. We have labeled this phenomenon excess churn, as the resultant reallocation of labor is beyond what is needed for replacement of workers leaving the firm for better job matches. Wages paid to newly hired workers are lower than the wages of workers who separated from the firm and collect unemployment benefits. These findings point to firms and/or workers taking advantage of the differences in welfare state insurance institutions across countries to form job matches that entail a surplus for the employer-employee pair, yet are inefficient from a social point of view.

Efficient labor migration requires that the jobs accepted in a host country are sufficiently productive to compensate for opportunity and training costs. When welfare state entitlements are larger in the host country (i.e., $A > 0$ in our theoretical model), there may be labor migration for productivity levels below these thresholds. The difference in the value of welfare state entitlements drives a wedge between private (for the employer-employee pair) and social efficiency. Moreover, it is clear that if there is heterogeneity in the value of welfare state entitlements—e.g., because of heterogeneous risks of future disability or health care costs—firms have incentives to recruit the workers with the highest entitlements, as they can be offered the lowest wages. This may represent a source of adverse selection, as seen from a fiscal point of view, as matches between native firms and immigrant workers will yield a higher worker-firm surplus the higher is the worker’s expected payoff from the welfare state. Excess churn happens when turnover costs are low. From a policy perspective, promotion of jobs that require qualified workers will reduce the scope for excess churning. While an investment in the human capital of the worker will make her less vulnerable to churning, a general subsidy of job-specific training will likely have the opposite effect as the subsidy will reduce turnover costs and amplify incentives to replace workers.

In the European context of an integrated labor market, welfare state differences between countries may thus lead to *too much* as well as to *fiscally adversely selected* (from the host country’s point of view) labor migration. The migrants’ shift in entitlement from a poor to a rich welfare state may in this context be viewed as an externality. In addition, the accrual of unemployment insurance entitlements in the host country may lead to excess churn.

Our findings may perhaps be used as arguments for a less liberal migration regime in Europe. There is now an ongoing policy debate in several countries about reestablishing elements of the previously existing migration barriers, either by regulating the migration flows directly or by making eligibility of economic transfers from a

particular country conditional on past social security contributions in that same country. However, although such measures may reduce the levels of excess migration and churning, they may also stifle the welfare-enhancing labor mobility within Europe. The source of social inefficiency identified in this paper does not necessarily imply that a liberal migration regime overall is negative for workers in the richer host countries. Recent empirical evidence suggests that natives in occupations that are particularly exposed to low-skill immigration (which, in our context likely corresponds to jobs with low turnover costs) move toward less exposed, and presumably better paid, occupations (Foged and Peri 2016). Migrants also tend to “grease the wheels” of the labor market through their higher geographical mobility (Borjas 2001; Røed and Schøne 2015), although Guzi et al. (2018) provide evidence indicating that this effect is smaller in countries with generous welfare programs.

An obvious policy alternative is to scale down on the overall generosity of welfare state institutions in the rich (old) EU countries, such that the externalities discussed in this paper become less important. Thriftier social insurance would improve work incentives for natives as well as immigrants, and reduce migration distortions generated by cross-country differences in social insurance systems. Such a policy might trigger a “race to the bottom,” however, as it seeks to ensure that a country’s own welfare state provisions are not too generous relative to those in other countries. And generous welfare state programs are in place for a reason. They reflect voter preferences for a low-risk society with sound insurance arrangements in case of sickness, disability, or involuntary unemployment. More generally, lower generosity will be against the interest of a majority that favors a relatively egalitarian society with little poverty. A strategy aimed at downscaling the welfare state motivated by the aim of facilitating efficient migration flows may also inspire more conflicts between immigrants and natives.

Since the operational channels of the efficiency problems identified in this paper are that firms set entry wages too low and replace existing workers too quickly, an alternative strategy is to mitigate the impact of the distortions generated by the welfare state by introducing yet another distortion, namely by enacting stricter employment protection regulations and/or minimum wages. A natural choice for a minimum wage is to set it such that it prevents excess churning, implying that it must exceed the value of unemployment. This principle may offer little practical guidance, however, as there is likely to be substantial heterogeneity in such values, depending on occupation, family situation, and human capital characteristics. While there is no national minimum wage legislation in Norway, there are a number of industry-specific minimum wages set through collective agreements. In general, these are not binding for firms and workers that are not part of these agreements; hence, they cannot prevent excess churn outside the organized parts of the labor market. However, there is an opening in Norwegian legislation for extending the wage rates and other conditions of collective agreements to all workers in the respective industries. This has been done for some industries particularly exposed to large waves of low-paid migrants, and empirical evidence has shown that such extensions both raise the actual wage level among migrant workers (Bratsberg and Holden 2015) and reduce the fraction of temporary migrant workers in the industry (Dapi 2016). Yet, although minimum wages may reduce excess churning as well as socially inefficient migration, they are also likely to eliminate some truly efficient migration. The latter will be the case if the minimum wage is set higher than

the immigrants' opportunity cost adjusted for migration costs. Hence, there is a tradeoff involved in the determination of a minimum wage.

8 Conclusions

This paper points to a source of inefficiency that deserves to be addressed in the context of European labor market integration. Based on Norwegian register data, we have shown that labor migrants from Eastern and Central European countries quickly have become overrepresented in the unemployment insurance program. To some extent, this appears to be driven by what we have labeled excess churn, i.e., the phenomenon that firms let existing workers go for unemployment, while at the same time recruiting new and similar workers at lower wages. Our findings indicate that this phenomenon is considerably more prevalent in firms with many workers from the new EU countries than in firms dominated by native workers.

From a theoretical perspective, we show that the matching of firms and workers in integrated national labor markets are easily distorted by differences in the countries' welfare state institutions. If the landing of a job in a high-income country also entails immediate membership in a more generous welfare state, the migrant worker not only receives remuneration from the new employer but can also expect compensation from the host country's taxpayers. In practice, the social insurance generosity wedge between countries operates as a wage subsidy targeted at immigrant workers from low-income countries and gives the firm an incentive to offer—and the worker an incentive to accept—a low entry wage. As a result, migration may become inefficiently high, since labor migration will be triggered by jobs for which labor productivity in the host country falls well below its opportunity costs.

Open borders between countries with similar levels of economic developments and welfare state ambitions are likely to unambiguously enhance living conditions of all citizens. However, the fact that social insurance benefits in some of Europe's high-income countries by far exceed typical wages in accession countries may distort migration flows, create low-productivity jobs, and weaken labor migrants' incentives to remain in productive employment over the long haul. These distortions not only affect the distribution of economic resources across countries but also imply that socially inefficient (from a European perspective) migration decisions are made. Our evidence is from a single country, but the excess churning mechanism is likely to be present in other European countries as well. As unemployment benefit eligibility is gained by migrant workers quickly after arrival within the EU, countries with high wages and ambitious welfare state programs will be exposed to the creation of low-productivity migrant jobs with high turnover. Given that the source of the inefficiencies described in this paper is the difference in welfare state entitlements across countries, the obvious policy response would be to harmonize these institutions. However, from a rich country citizen's point of view, this could appear as a race to the bottom, implying a suboptimal provision of social insurance. In practice, policy makers thus have to strike a balance between different legitimate aims and concerns. We have argued that the imposition of minimum wages can be an alternative/supplementary strategy to discourage socially inefficient migration, and thus offset the distortions generated by differences in welfare state institutions. However, as minimum wages may also prevent

socially beneficial migration from taking place, as well as distort the national labor market, there are some tradeoffs involved in the usage of this policy tool as well.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Appendix

Table 7 Multi-firm ownership clusters and churn

	Churn		Excess churn	
	(1)	(2)	(3)	(4)
New EU share	-0.087*** (0.013)	-0.087*** (0.015)	0.015*** (0.005)	0.014*** (0.005)
Old EU share	-0.016 (0.033)	0.007 (0.029)	-0.009* (0.005)	-0.010* (0.005)
Share high-skill occupations	-0.002 (0.015)	-0.003 (0.014)	-0.012*** (0.003)	-0.012*** (0.003)
Multi-firm cluster	0.027*** (0.009)	0.033*** (0.009)	0.003*** (0.001)	0.003*** (0.001)
Multi firm*new EU share		0.002 (0.023)		0.004 (0.007)
Multi firm*old EU share		-0.108 (0.069)		0.003 (0.008)
Sample mean	0.114	0.114	0.015	0.015

*/**/***Significant at 10/5/1 percent level. Standard errors, clustered within ownership clusters, are reported in parentheses. Regressions have 229,872 observations and control for 62,680 ownership fixed effects, firm size, and year of observation. Regressions are weighted by firm/ownership workforce

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