

Labour migration has emerged as a defining labour market and demographic challenge of recent decades, carrying substantial implications for workforce availability, demographic sustainability, and public policy. From a human capital perspective, the decision to migrate for work constitutes an investment undertaken with the expectation of future returns: higher wages, skill acquisition, and enhanced career prospects (Sjaastad, 1962; Dustmann et al, 2011).

A growing body of empirical research demonstrates that a substantial proportion of emigrants eventually return to their home country and that this process is shaped by selective mechanisms (Borjas & Bratsberg 1994. Return migration may be positively or negatively selected depending on migrants' relative success at the destination, and can increasingly be understood as part of a deliberate long-term strategy driven by economic, personal, or policy-related factors. The selectivity of return has direct implications for the wage and occupational outcomes that returnees experience upon reintegration into their home labour market (Wahba, 2015).

Migrants also exhibit diverse demographic profiles and differ substantially in their motivations for emigration as well as in their intentions to return. They vary in their labour market characteristics, particularly with respect to skill level, and differ across demographic, socioeconomic, and geographical dimensions (Dustmann & Weiss, 2007). This heterogeneity has important consequences during the reintegration and for labour market outcomes upon return (Wahba, 2022).

A fundamental identification problem in the empirical analysis of return migration outcomes is endogeneity (Hárs & Simon, 2025). Migration is inherently non-random: younger, more educated, and more ambitious individuals are disproportionately likely to emigrate in search of higher returns to their skills abroad. This positive selection implies that comparisons between returnees and stayers will tend to overstate the actual migration premium. At the same time, meaningful human capital accumulation through migration - including skill acquisition, occupational training, and language proficiency - typically requires a sufficiently long duration abroad (El-Mallakh & Wahba, 2021). Consequently, observed wage premiums among returnees may partly reflect pre-migration advantages and positions rather than skills genuinely acquired through the migration experience itself.

We examine Hungarian emigrants and returnees using administrative panel data consisting of monthly records that provide longitudinal information on individual employment spells and earnings between 2003 and 2022. To identify emigration and return events, we exploit the institutional setting of the Hungarian social security system. Health insurance contributions are mandatory for registered residents and must be paid on a monthly basis. Individuals who leave the country are required to suspend their domestic insurance coverage, while upon return they must re-register and resume contributions. These registration and contribution records allow us to identify individuals who exited the country and subsequently returned. To address potential selection bias, we apply propensity score matching to compare returnees with observationally similar non-migrants based on key pre-migration characteristics including age, education, gender, occupation, region of residence, and pre-migration wage level.

In our empirical approach, we apply propensity score matching, enabling us to construct a comparison group of stayers who are observationally similar to returnees prior to emigration.

The treatment indicator identifies returnees relative to matched stayers, the post indicator flags the period after the return event, and a calendar month index (t) captures wage trends over the observation window. The key

quantity of interest is the three-way interaction term $\text{treated} \times \text{post} \times t$, which captures whether the wage gap between returnees and stayers expands or contracts over time following return.

Table 1 presents the stepwise regression results for log monthly wages across six specifications. Models 1 through 3 establish the baseline selection penalty and progressively absorb time trends. Models 4 through 6 introduce the interaction terms that capture the dynamic post-return adjustment process, with Model 6 additionally incorporating demographic controls.

Table 1

Variable	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	11.96*** (0.01)	11.89*** (0.01)	11.35*** (0.02)	11.22*** (0.02)	11.21*** (0.02)	9.29*** (0.05)
treated	-0.40*** (0.02)	-0.40*** (0.02)	-0.30*** (0.02)	0.07** (0.03)	0.10*** (0.03)	0.05* (0.02)
post		0.49*** (0.01)	0.09*** (0.02)	-1.29*** (0.11)	-0.58*** (0.11)	-0.43*** (0.12)
month			0.00*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)
treated $\times$ post				-0.23*** (0.04)	-3.02*** (0.31)	-1.70*** (0.34)
treated $\times$ month				-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
post $\times$ month				0.01*** (0.00)	0.00*** (0.00)	0.00*** (0.00)
treated $\times$ post $\times$ month					0.01*** (0.00)	0.01*** (0.00)
educational level						0.45*** (0.01)
age						0.02*** (0.00)
capital						0.07*** (0.01)
male						0.20*** (0.02)
Observations	937,257	937,257	937,257	937,257	937,257	851,335
R ²	0.03	0.06	0.12	0.13	0.13	0.22
Adj. R ²	0.03	0.06	0.12	0.13	0.13	0.22

Notes: Dependent variable is log monthly wage ($\ln w$). treated = returnee indicator; post = post-return period; month = calendar month index. Standard errors clustered at the individual level in all specifications. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Our preliminary stepwise models reveal a consistent and theoretically coherent story. In the simplest specification (Model 1), returnees earn approximately 33% percentage points (40 log points) less than matched stayers on average across the observation timeframe. However, this estimate conflates pre-migration selection with the return adjustment process and does not identify any causal wage effect.

The coefficient on *treated* changes sign, from strongly negative in Models 1–3 to a modest positive in Models 4–6. This pattern suggests that once the timing structure of the data is accounted for, returnees may have held a slight wage advantage relative to matched stayers in the pre-migration period, though this result should be interpreted with caution, as it is conditional on the model specification and the matching procedure. To the extent that this reflects positive pre-migration selection, it would imply that naive cross-sectional comparisons risk confounding pre-existing differences with the post-return adjustment process, potentially understating the true reintegration cost. Further robustness checks are warranted before drawing stronger conclusions.

The primary difference-in-differences coefficient, captured by $treated \times post$, is negative and statistically significant. In the most conservative specification (Model 4), this coefficient equals -0.23 , equivalent to an approximate wage penalty of 20–25% upon re-entry into the Hungarian labour market. In the extended specifications (Models 5–6), the magnitude of this coefficient increases substantially, as the three-way interaction term absorbs the time-varying component of the treatment effect, concentrating the negative level shift at the moment of return.

Nevertheless, the initial penalty does not appear to be permanent. The three-way interaction term ($treated \times post \times t$) is positive and statistically significant across both Models 5 and 6, indicating that the post-return wage gap narrows monotonically over time. The estimated post-return wage gap narrows gradually over time, with returnees converging towards the wage trajectories of observationally comparable non-migrants. This recovery pattern is consistent with the hypothesis that skills and human capital accumulated abroad require time to be recognised and rewarded in the domestic labour market, resulting in delayed returns to foreign work experience.

Model 6, which adds demographic controls (education level, age, gender, and capital city residence), produces estimates that are substantially consistent with the more parsimonious specifications. The explained variance increases from 13% to 22%, confirming that demographic variables explain meaningful additional wage variance. All demographic controls are significant and in theoretically expected directions: education carries a large premium (roughly 57%, equivalent to $+0.45$ log points per level), wages increase with age, men earn approximately 22% more than women (0.20 log points), and workers in the capital and major urban centres (cities) earn a regional premium.

This paper contributes to two strands of the literature on return migration. First, we provide new evidence on wage dynamics following return migration using detailed administrative panel data spanning nearly two decades - a sufficiently long timeframe, enabling us to follow the path of wage convergence rather than just its initial phase. Second, we exploit a novel institutional identification strategy based on mandatory health insurance registration records to observe the full migration cycle.

Our findings suggest that return migration conveys both short-term costs and long-term potential benefits. The initial wage adjustment is notable: a 20–25% wage penalty upon return represents a considerable setback for returnees. However, the observed pattern of convergence in wage differences and the estimated positive pre-migration selection of returnees relative to stayers suggest that the initial wage gap narrows over time. The positive three-way interaction implies that the returns to outward migration are not fully realised at the time of return but accrue gradually over the years following labour market reintegration.