3.2 FIRM CHARACTERISTICS AND HEALTH

MÁRTA BISZTRAY, ANIKÓ BÍRÓ & DÁNIEL PRINZ

In this subchapter we examine the relationship of health and firm characteristics, primarily ownership. The administrative labor market and health data prepared by the Databank of the Centre for Economic and Regional Studies make this analysis possible for the first time in Hungary. This data contains health indicators, employment history, and information on employers and firms.[1] The relationship between firm characteristics and health status runs both ways: individuals' health status influences their type of employment (*Madden,* 2004, *Pelkowski–Berger,* 2004), while the characteristics of employers and employment conditions influence health (*Fletcher et al.,* 2011). We focus on associations, rather than identifying causal relationships, our analysis is primarily descriptive. In the second part of the subchapter, we move towards a more causal analysis, examining the consequences of health shocks by firm characteristics.

Health indicators at domestic and foreign companies

We divide firms into two groups based on foreign ownership share: we categorize firms with less than 50% foreign ownership as *domestic firms* and firms with more than 50% foreign ownership as *foreign firms.* Our results are based on data for years 2009–2017.

Our sample contains workers between ages 20 and 60 who were employed for at least 6 months in a year at the same firm, limiting to firms with at least 10 workers.[2] We adjust health indicators for year fixed effects. In addition, we report results that are also adjusted for age and gender.[3]

Prescription drug spending and inpatient hospital days

We first examine annual prescription drug spending (sum of social security and out-of-pocket spending) and annual inpatient hospital days.[4]

The left panel of *Figure 3.2.1* shows that the average prescription drug spending of workers of foreign firms is 20% lower than that of workers of domestic firms. This difference decreases considerably once we adjust for age and gender, with age playing a larger role. The right panel of *Figure 3.2.1* reveals a similar pattern for inpatient hospital days. For this category the relative difference between the workers of foreign and domestic firms persists after adjusting for age and gender. Inpatient hospital days likely capture more serious illness. Overall, we see that foreign firms employ younger and healthier workers.

1 For a short description of the database, see the Appendix of the *In Focus* section. For more details, see *Sebők* (2019).

2 We exclude women receiving maternity payments, including the period during which they receive payments and the 12 months prior (approximately the period of pregnancy). We exclude companies where the majority of employees are categorized as public employees and also companies where there were more than 10 public employees in any year. Our goal with this exclusion is to focus on firms in the private sector that have at least 10 employees.

3 The key results are robust if in addition to calendar year, age, and gender we also adjust for industry (one-digit NACE code), firm size (in six bins), and occupation (one-digit ISCO code).

4 *Bíró–Elek* (2018) find that among healthcare spending categories, prescription drug spending is the most predictive of mortality. At the same time, among individuals with lower levels of prescription drug spending undiagnosed health problems can also occur, and these may be correlated with lower income.

Figure 3.2.1: Annual prescription drug spending and inpatient
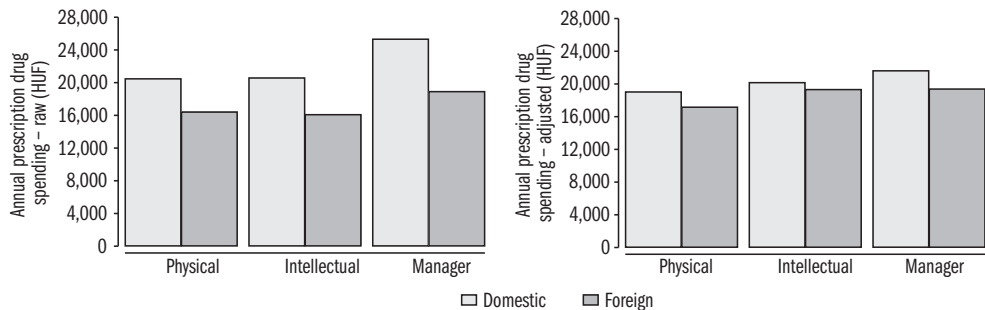hospital days by firm ownership
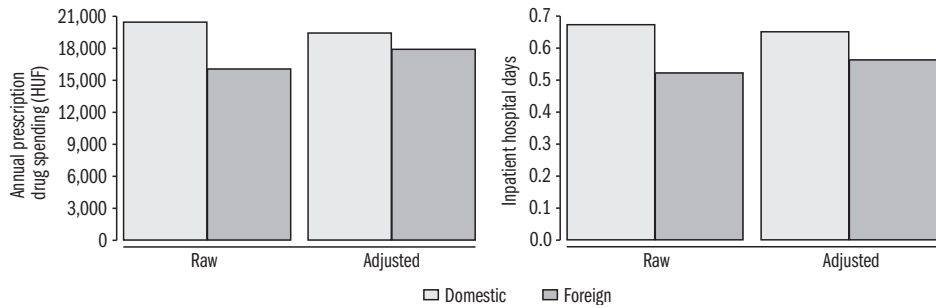
Note: Adjusted indicators are adjusted for calendar year, age, and gender. The differ-
ences between foreign and domestic companies are always significant at 99% level.
Source: Authors' calculation based on Admin3 data.

Prescription drug spending by occupation

Based on ISCO codes, we divide workers into two groups: physical and in-
tellectual workers. Among intellectual workers, we separately examine man-
agers.[5] *Figure 3.2.2* shows that average prescription drug spending is highest
among managers in both domestic and foreign companies, even after adjust-
ing for age and gender. Differences between intellectual and physical workers
only emerge after adjustment, suggesting that age and gender composition is
important. The difference between managers and other intellectual workers
is larger at domestic companies than at foreign companies. It is important to
emphasize that these patterns could mean that the health status of manag-
ers is worse or that for a given health status they are more likely to use pre-
scription drugs – due to better access and stronger incentives to preserve their
working capacity. This should be recognized when we interpret differences
in prescription drug spending.

5 We categorize ISCO 1–4 as
intellectual work and ISCO
5–9 as physical work. We cat-
egorize ISCO 1 as managers.

Figure 3.2.2: Annual prescription drug spending by ownership and occupation

Note: Adjusted indicators are adjusted for calendar year, age, and gender. The differ-
ences between foreign and domestic companies are always significant at 99% level.
Source: Authors' calculation based on Admin3 data.

Figure 3.2.2 also shows that while using raw data, prescription drug spending is lower among the workers of a foreign firm in all three occupational groups, using adjusted indicators this difference substantially decreases, remaining the largest (10%) among physical workers. If we assume that access to care and health preferences are similar among workers of foreign and domestic companies, this result suggests that at foreign companies, physical workers are of better health. Further research is needed to understand whether this is a consequence of selection or of different working conditions.

Prescription drug spending by therapeutic categories

We examine six therapeutic categories based on the active ingredients of prescription drugs consumed. We categorize an individual as a user of a particular therapeutic category if they had any prescriptions in that category in a given year. The six categories examined are Alimentary Tract and Metabolism (ATC A, mostly antidiabetic drugs), Cardiovascular System (ATC C, mostly anti-hypertensives and cholesterol-lowering medications), Antiinfectives for Systemic Use (ATC J, mostly antibiotics), Musculo-skeletal System (ATC M), Nervous System (ATC N, including antidepressants and tranquilizers), and Respiratory System (ATC R) diseases. *Figure 3.2.3* shows the share of workers using drugs from each group, adjusting for calendar year, age, and gender.

Figure 3.2.3: Share using prescription drugs by category and firm ownership, adjusted for calendar year, age, and gender
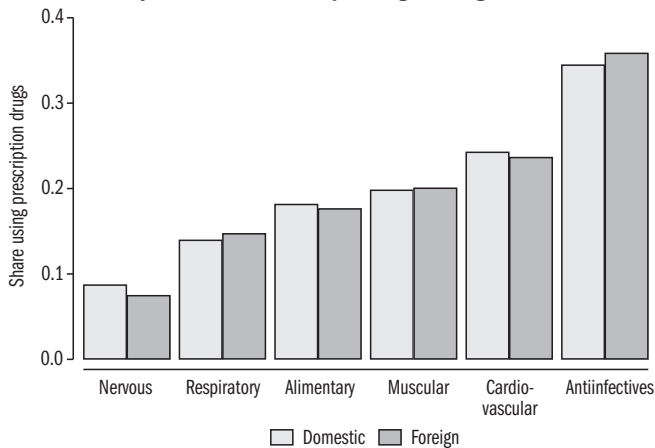
Note: The differences between foreign and domestic companies are always significant at 99% level.
Source: Authors' calculation based on Admin3 data.

In line with *Figure 3.2.1* this figure also shows that adjusted indicators show only small differences between firm types. Prescription drug use in the Nervous System category is 6% lower at foreign firms. For Anti-infectives for Systemic Use and Respiratory System drugs this pattern is reversed, after adjust-

ment they are 3% and 7% more likely to be used at foreign firms, though the absolute difference is small, below 1 percentage point.[6] The latter categories contain drugs that are typically prescribed for infectious diseases, suggesting that these patterns are consistent with the hypothesis that conditional on being sick, workers of foreign companies are more likely to use prescription drugs.

Consequences of health shocks

Finally, we examine the probability of remaining in the workforce and remaining at the same firm in the year following a health shock. We define health shock as having prescription drug spending in the top decile of the distribution in a given year, such that in the preceding two year period it was lower than the top quartile. We categorize individuals as remaining in the workforce if they are employed for at least one month in the calendar year following the health shock. We categorize an individual as remaining at the same firm if they work at the same firm in the year preceding and following the health shock and as not remaining at the firm if they were working during the year preceding the health shock but not working in the year following the health shock or work at a different firm. We estimate fixed effects regressions, where the dependent variable is either working in the year following the health shock or working at the same firm in the year following a health shock, the main explanatory variable is the interaction of the presence of a health shock and firm type, and control variables include age, calendar year, and individual fixed effects.

Table 3.2.1 suggests that among those who worked at a domestic firm in the year before the health shock, the health shock decreases the probability of remaining in the workforce by 5.1 percentage points. Among workers of foreign firms this negative effect is 2 percentage points lower at 3.1 percentage points.

Table 3.2.1: The impact of health shocks on employment by firm type (linear probability model with fixed effects)

	Working	Working at the same firm
Firm type (reference group: domestic)		
Foreign	–0.0008	0.0815***
	(0.0007)	(0.0011)
Health shock	–0.0512***	–0.0338***
	(0.0020)	(0.0031)
Health shock × foreign firm	0.0200***	0.0265***
	(0.0033)	(0.0056)
Age, year, and individual fixed effect	yes	yes
Observations	5,870,079	5,870,079
Individuals	1,573,657	1,573,657

Note: Robust standard errors in parentheses. Sample average share remaining in the workforce 92%, sample average share remaining at the same firm 57%.
*** 1 percent, ** 5 percent, * 10 percent level significance.
Source: Authors' calculation based on Admin3 data.

6 Differences by ownership disappear completely for Respiratory System and Antiinfectives for Systemic Use drugs, and reverse for Musculo-skeletal System drugs if in addition to calendar year, age, and gender, we also adjust for occupation (one-digit ISCO), industry (one-digit NACE), and firm size.

The second column of the table shows that health shocks decrease the probability of remaining at the same firm by 3.4 percentage points at domestic firms, partly due to becoming unemployed or inactive, partly due to changing employers (moving to a company more accommodating of sickness). This estimate is lower – by less than 1 percentage point – among workers of foreign firms. Further calculations show that if we include additional interactions between health shocks with gender, age (as a continuous variable), and occupation (physical or intellectual) then the sign of the foreign firm coefficient remains the same but its size decreases. In this model, working at a foreign company decreases the impact of a health shock on remaining in the workforce by 1 percentage point (p-value 0.006). The impact of a health shock on remaining at the same firm is decreased by 1.3 percentage point (p-value 0.056) at foreign firms. It is possible that the difference between foreign and domestic firms is caused by higher average wage or better working conditions, but further research is needed to understand these explanations more precisely.

These results are robust under alternative definitions of health shocks: if we define health shocks requiring healthcare spending to be below the top decile (instead of top quartile) in the preceding year or if we only count two years in the top decile as a shock. It is important to emphasize, that our results count someone as working if they are on extended sick leave, and our interpretation assumes that there are no important differences in the types of health shocks experienced by workers at different types of firms.

Conclusion

Matched employer-employee (admin3) data shows that in the 2009–2017 period we can observe systematic differences in the health indicators of workers at domestic and foreign firms. The workers of foreign firms are on average healthier based on prescription drug spending and inpatient hospital days, but a large share of these differences is explained by compositional differences, in particular the employment of younger workers by foreign firms. Examining types of prescription drugs, controlling for compositional differences by age and gender, we uncover some evidence of the selection of healthier workers by foreign firms, although we see results reverse for Anti-infectives for Systemic Use and Respiratory System drugs. Finally, our regression analysis shows that following a health shock workers of foreign firms are more likely to continue working and remain at the same firm.

Our results suggest that health status is associated with type of employment. Healthier (and younger) individuals work at firms offering higher pay and better working conditions, contributing to health inequality by income. At the same time, we also see that following the deterioration of health, remaining in the workforce and at the same firm is more common at foreign firms, sug-

gesting that the impact of health status on joining a company is larger than the impact of remaining at a firm.

References

BÍRÓ, A.–ELEK, P. (2018): How does retirement affect healthcare expenditures? Evidence from a change in the retirement age. Health Economics, Vol. 27, No. 5, pp. 803–818.

FLETCHER, J. M.–SINDELAR, J. L.–YAMAGUCHI, S. (2011): Cumulative effects of job characteristics on health. Health Economics, Vol. 20, No. 5, pp. 553–570.

MADDEN, D. (2004): Labour market discrimination on the basis of health: an application to UK data. Applied Economics, Vol. 36, No. 5, pp. 421–442.

PELKOWSKI, J. M.–BERGER, M. C. (2004): The impact of health on employment, wages, and hours worked over the life cycle. The Quarterly Review of Economics and Finance, Vol. 44, No. 1, pp. 102–121.

SEBŐK, A. (2019): The Panel of Linked Administrative Data of KRTK Databank. Working Papers On The Labour Market (BWP) 2019/2. Institute of Economics, Centre for Economic and Regional Studies, Budapest.