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TALENT WORKERS AS ENTREPRENEURS: A NEW APPROACH TO ASPIRATIONAL SELF-EMPLOYMENT

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Talent workers as entrepreneurs: a new approach to aspirational self-employment

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Abstract

What is necessary to make entrepreneurship sector successful? It seems like two key factors in this matter are quantity of financial capital and quality of human capital. So far, studies on innovative firms were rather focused on spending on resources, and not on qualification of people who are entering entrepreneurship sector. Using concept of so-called talent workers (Hsieh et al. 2013) we check who is entering self-employment in Poland. Our question is whether people who enter self-employment are more likely to create successful businesses. The analysis is based on the labor force survey panel data for Poland for over a decade between 2001 and 2013. We found that talent workers were more likely to become self-employed in this period. Results are robust on two possibly confounding effects – within sector mobility and productivity of workers before entering self-employment.

Keywords:
inequality, longevity, defined contribution, defined benefit, Gini

JEL:
J62, J24

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1. Introduction

In the standard Schumpeterian understanding, entrepreneurs give way to innovation and thus economic growth. Conceptually, entrepreneurs are responsible for job creation, productivity growth and production and commercialization of ever increasing quality and variety products, see for example Wennekers and Thurik (1999), Van Stel et al. (2005), Carree and Thurik (2010). Even in the exogenous growth models – such as the Solow growth model – entrepreneurship can provide leverage for a higher steady state growth path, see Audretsch (2007). Yet, while all these predictions find support in empirical context as well – see Praag and Versloot (2007) – data limitations often imply that entrepreneurship is identified with self-employment. This may prove relevant for policy implications if the so-called 'necessity self-employment' (Reynolds et al., 2002) is frequent in a country. Indeed, Estrin et al. (2013) propose a separation of what they identify as aspirational self-employment and necessity self-employment, with an implicit conjecture that it is the aspirational self-employment that fosters economic growth, see also Estrin et al. (2011a).

While there are striking differences in entrepreneurship rates between countries – see e.g. Estrin et al. (2013) – the intensity of business start-ups tends to be fairly stable and inversely linked to GDP per capita. Indeed, in richer countries there is much less entry into self-employment. Yet, this empirical regularity has little micro-foundations: are more productive workers more or less likely to start-up a new business? While this question remains unanswered in most countries analyzed in the literature, individuals who run businesses are on average somewhat less educated than the wage employed, run businesses in somewhat less profitable industries and are located in more remote regions (e.g. Van der Sluis, 2005). On the other hand, a number of studies – e.g. Thurik et al. (2008), Schwens et al. (2011) – shows that there are positive returns to switching from wage employment to self-employment. These two findings would suggest that there are strong selection effects, with a possibly large role for unobservable heterogeneity. Indeed, for entrepreneurship to be conducive to economic growth, it is necessary that the self-employed have the potential to actually engage in innovative activities. With skill-biased technological change, the ability to successfully innovate and promote new business models requires substantially more education and skills than previously. Are highly educated workers in high-skill occupations and well-paying industries more or less likely to engage in entrepreneurship? What concerns the decision to switch to self-employment; should the state provide incentives in this selection processes?

In this paper we propose to analyze the flows from wage-employment to self-employment with a special emphasis on this group. We are particularly interested in aspirational self-employment due to its importance to economic development. Namely, we want to verify if – regardless of the business cycle fluctuations – flows from employment to self-employment tend to attract individuals with higher potential to innovate. We operationalize the potential to innovate using the notion of *talent workers* proposed by Hsieh et al. (2013). The advantage of this approach is that the identification relies on information usually available in standardized datasets such as censuses, labor force surveys, etc. We analyze a panel of more than a decade of labor market flows: between jobs and to self-employment. We ask explicitly if talented workers are more likely to switch to self-employment.

Our problem is well rooted in the theory of entrepreneurship, relating closely to the very definition of an entrepreneur. If we follow Low and MacMillan (1988), who consider entrepreneurship to be

an idiosyncratic gene which tends to touch upon any moment of population distribution, the *talent workers* should be no different from other workers when weighing the options of changing a job or becoming self-employed. On the other hand, if we follow Lazear's (2005) 'jack of all trades' approach, indeed the *talent workers* should be less likely to change from wage to self-employment. Also Bull and Willard (1993), building on the numerous case studies, emphasize the intrinsic motivation not to work for the others (in contrast to an intrinsic motivation to invest in human capital and employer-specific skills, as would typically characterize talent workers). The widely cited work by Blanchflower and Oswald (1999) emphasizes that working for oneself implies higher life and job satisfaction.

Subsequent studies elaborated on the role of the internal factors of entrepreneurship as well as external ones, see Parker (2006), Minniti and Levesque (2008). For the internal factors, studies interested in analyzing and identifying psychological traits attempt to recognize characteristics which help understand why an individual makes the decision to become self-employed, for example e.g. Caliendo and Kritikos (2008) and Hessels et al. (2008). Also, factors differentiating self-employed *per se* from entrepreneurs were under scrutiny in numerous analyses, see for example Bengtsson et al. (2013). Typically the findings point to lower risk-aversion and stronger locus of control, see Åstebro and Thompson (2011) for a recent review. Self-employed are also less biased towards status quo, Burmeister and Schade (2007). Interestingly, many of the gender related differences can be explained by psychological differences between men and women (Bengtsson et al., 2012).[1]

For the external factors, much of the earlier research has elaborated on the cross-country dispersion in self-employment rates in order to identify factors which stand behind high levels of entrepreneurship. Empirical evidence points to the relevance of institutional factors (e.g. Aidis et al. 2007, Meyer et al. 2009), cyclical factors (Naudé 2010) as well as socio-economic factors typically embodied by country-level fixed effects. Typically business or institutional environment was used to explain cross-country differences in self-employment rates and success rates, see Blanchflower (2000), Blanchflower et al. (2001). Estrin et al. (2013) is another such example, but in this case the analysis focuses on which institutions are conducive to higher rate of entrepreneurial aspirations among the self-employed. Also with relation to gender differences, Estrin and Mickiewicz (2009) find that these institutional differences explain well why in some countries female entrepreneurship is more prevalent than in others. Yet another important factor is openness and economic freedom in general. Estrin and Mickiewicz (2011b) show for example that centrally planned economies are in general characterized by lower self-employment rate even already after the transition, which they attribute to both legacy of the pre-transition economic system and to the naturally slow pace of development in business environment, emphasizing the role of general trust and strength of the social networks. Similar argument are made by Audretsch et al. (2008). The mechanisms behind this empirical regularity include links to market size (Di Addario and Vuri, 2010). In addition to institutional factors, a large share of literature focuses on the role of demographics and aging in the

[1] It is beyond the scope of most of the analyses – including our paper – to distinguish between nature and nurture in this respect.

changing self-employment patterns, especially in advanced economies, see Boente et al. (2009), Levesque and Minniti (2011) or Liang et al. (2014).

These analyses, while providing important policy implications, still give little or no explanation for why an individual would chose self-employment over wage-employment. Except for non-economic psychological explanations and exogenous general institutional explanations, these studies say little about the actual individual choice, see Fuchs-Schündeln (2009). In this respect there are two basic strands in the literature. In the first, identifying entrepreneurship with innovativeness, Hellman (2007) proposes a theoretical framework to explain when new ideas will be developed by employees and when will the willingness to work on new ideas translate into self-employment. In his framework, strength of the intellectual property protection as well as conducive environment interact, showing that indeed with harsh environment, helpful employers and incomplete IP protection, new ideas will be developed within the existing firms. Yet, the identification of entrepreneurship with innovation may be unsatisfactory from both conceptual and empirical perspectives. This point was further elaborated by – among many - de Bettignies and Chemla (2008) or Parker (2012).

A contrasting, second viewpoint assumes that self-employment is just another form of employment, whereas – figuratively – setting up a business is just another form of job search. This line of reasoning builds on the distinction between the necessity self-employment as opposed to aspirational entrepreneurship. In principle, with self-employment, there are no entry barriers, which makes it work as a counter-cyclical buffer and a labor market segment where otherwise discriminated workers can continue activity.[2] For example, Llisterri et al. (2006) argue that this indeed is the case for youth in Latin America. Maloney (2009) shows self-employment also works as a counter-cyclical buffer at times of low labor demand. Naudé (2010) argues that in fact, especially in the context of developing countries, wealth barriers may be less relevant than lack of access to jobs and the so-called necessity self-employment is not a trace of low entrepreneurial aspirations but quite the opposite. Also, it is the fear of not being able to find a job rather than the actual experience of unemployment that drives the decision to start a new business. In the context of transition economies, it has even been claimed that a fairly large fraction of startups are 'unemployment in disguise', see Earle and Sakova (2000). With reference to a highly developed country – Finland – this line of reasoning was taken to a further level by Hyytinen and Ilmakunnas (2005, 2007), who explicitly compare a decision to change a job with a decision to start a new firm. They find that in fact decision to change a job and a decision to become self-employed are governed by different factors, the former being more predictable.

Relating to the literature, we test empirically if self-employment attracts more of the *talent workers*. We employ data for Poland, which is a particularly interesting example: the self-employment rates are among the highest in the EU, averaging about 20% of the labor force (10% outside agriculture).

[2] Naturally, there is also abundant literature on the role of wealth, inheritance and family tradition in self-employment, see Blanchflower and Oswald (1998), Holtz-Eakin et al. (1994), Fairlie et al. (2012), Fairlie and Robb (2007), Disney and Gathergood (2009), Dick et al. (2006) or Fossen (2012), to name just a few of the most recent ones. Since we have no access to data on wealth or family history, we abstract from this literature in the reminder of our paper.

Given the massive transition of the economy from manufacturing to service sector – the share of the former in employment dropped from app. 60% to app. 30% - observed over the past two decades, it seems Poland is also a country with relatively high scope for labor market mobility. Exploring the *quasi*-panel design of the Labor Force Survey we construct a new dataset on labor market flows between wage-employments and self-employment. We find that *talent workers* are more likely to start a new firm than to move to another job. This result is robust to a number of checks: we control for income, mobility and attempt to control also for unobserved heterogeneity.

The contribution of this paper is threefold. First, to the best of our knowledge this is the first study to analyze the choice of becoming self-employed over moving to another wage-employment. Thus, we hope to capture those who purposefully engage in entrepreneurship. Second, we focus specifically on the *talent workers*. The rationale behind such focus comes from the observation, that the *talent workers* are by definition more likely to be aspirational self-employed. Third, we perform this analysis using a fairly long time-span for a country in transition, with relatively high rates of self-employment. These three characteristics all speak in favor of high rates of survival or necessity self-employment, thus yielding a relatively conservative set of conditions for the aspirational self-employment. Indeed, we find that the *talent workers* are more likely to choose self-employment than wage-employment. This effect is robust to a number of checks, including controls for industry specific mobility, job destruction, relative incomes and relative productivity.

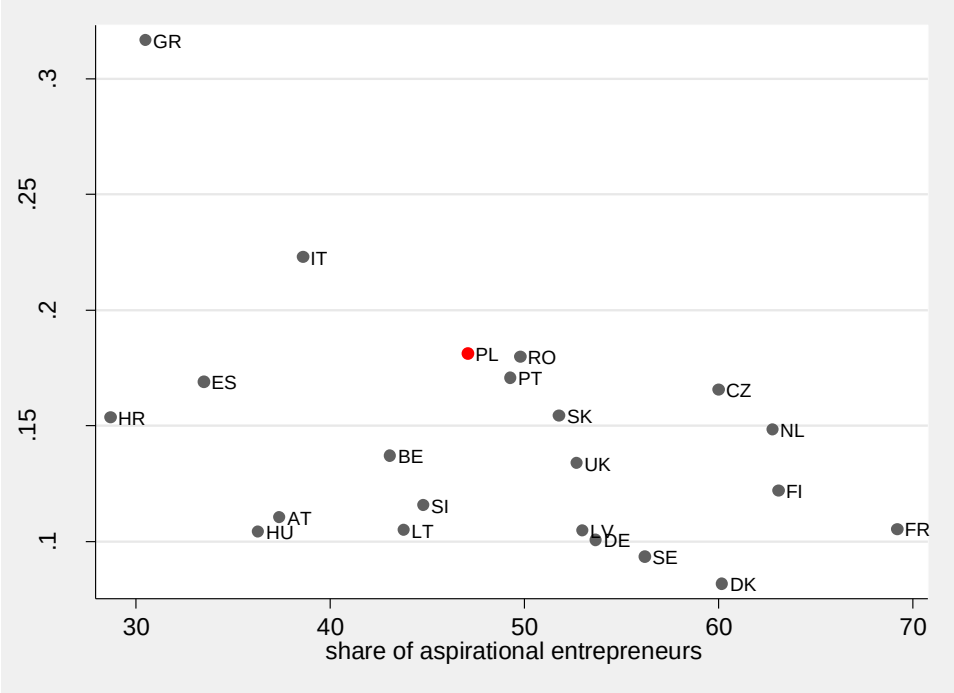
Having discussed above the insights from the literature, the reminder of this paper is structured as follows: In the next section, we shed some light on the context of self-employment in Poland. We discuss the basic tendencies, such as the role of age, education and experience in some industries/occupations for labor market mobility. In Section 3, we move to detailing the identification strategy adopted in this study. We will evaluate those who switch into self-employment against those who exhibit any form of labor market mobility. In Section 4, we show the results for various tests, answering the question if 'talent workers' stand out in labor market mobility tendencies. The paper concludes with the policy implications of our study.

2. Data and a descriptive analysis

Compared to other European countries, the Polish entrepreneurial sector is quite large. Currently, more than 18% of the total working population consider themselves as 'self-employed'. This places Poland above the EU average (14%) and in the third place among EU countries – only in Greece and Italy is the self-employment sector larger in comparison to whole working age population, see Figure 1. Despite this high rate, the Global Entrepreneurship Monitor definitions reveal that less than half of this group is actually driven to start up a new firm because of a business opportunity, which is the GEM definition of aspirational self-employment, see Reynolds et al (2002).

As for the purpose of our study, we rely on Polish Labor Force Survey data for years 2001 to 2013 for individual-level data with information about past and current labor market status. The time boundaries are implied by the availability of variables in the questionnaire. The question about last year's labor market status and last year's industry appeared only 2001. Data from 2013 are the latest available.

Figure 1. Self-employed and aspirational entrepreneurship in EU



Source: EUROSTAT LFS Data for the self-employment rates (2013), and GEM for the aspirational self-employment (2014, Latvia and Czech Republic - 2013).

Labor Force Survey is conducted in Poland on a quarterly basis, but it is a *quasi*-panel, i.e. approximately 50% of the sample is observed for two consecutive quarters (with the so-called 2-2-2 design). The survey is currently conducted on a representative sample of app. 100 000 individuals, but prior to 2010 the sample size was smaller (app. 50 000 individuals). Given that some of them are children or adolescent, while others are already retired and, additionally, activity rate in the working age population falls short of 60% in the analyzed period, our combined panel includes app. 2,6 million observations on working individuals. Given that a question about last year's labor market status and industry may imply to the responders anything between last quarter (if asked in q1 of a new year) and last 4 quarters (i.e. a 12 month period before participating in the survey), we use annual frequency data. Thus, although after compiling a panel some individuals may be observed more than once, we effectively only make use of one instance per individual.

In that group labor market status (current of from the previous year) reflects well the general tendencies in the population, see Table 1. Since we are interested in those who change from wage-employment to self-employment (henceforth WE and SE, respectively), we drop from the sample individuals who are unemployed and individuals who report being self-employed in the agriculture. This yields a total sample of 337 939 individuals.

Table 1. Sample size - unique individuals in final sample

Labor Market Status	No of individuals	No of women	No of men	No of talent workers
Wage employees (WE)	298 129	141 771	156 358	65 257
Self-employed (SE)	39 810	12 994	26 816	8 507
Unemployed (U)	65 310	31 794	33 516	-
Inactive (I) in working age	303 917	177 536	126 381	-
WE -> SE	1 534	490	1 044	381
WE -> WE (Identification 1)	21 953	8 132	13 821	3 298
WE -> WE (identification 2)	8 182	3 125	5 057	381

Data: Polish LFS, 2001q1-2013q4.
Notes: Identification 1 is based on self-reported tenure with the current employer (under 13 months). Identification 2 is based on reporting different industry of employment between current and previous year.

Relying on self-reported changes in labor market status we identify that approximately 0.5 per cent of the wage-employees decide to start up their own business. This totals 1 534 such individuals in our sample of 12 years[3]. In addition, approximately 7 per cent of the WE report changing a job. Of those who change a job within the last 12 months, approximately 13 thousand stay and app. 8 thousand change industry of employment. In the second specification, we included only workers who reported different last year and current industry of occupation[4]. Industry is defined according to NACE, 2 digits.

2.1. Talents and tertiary educated

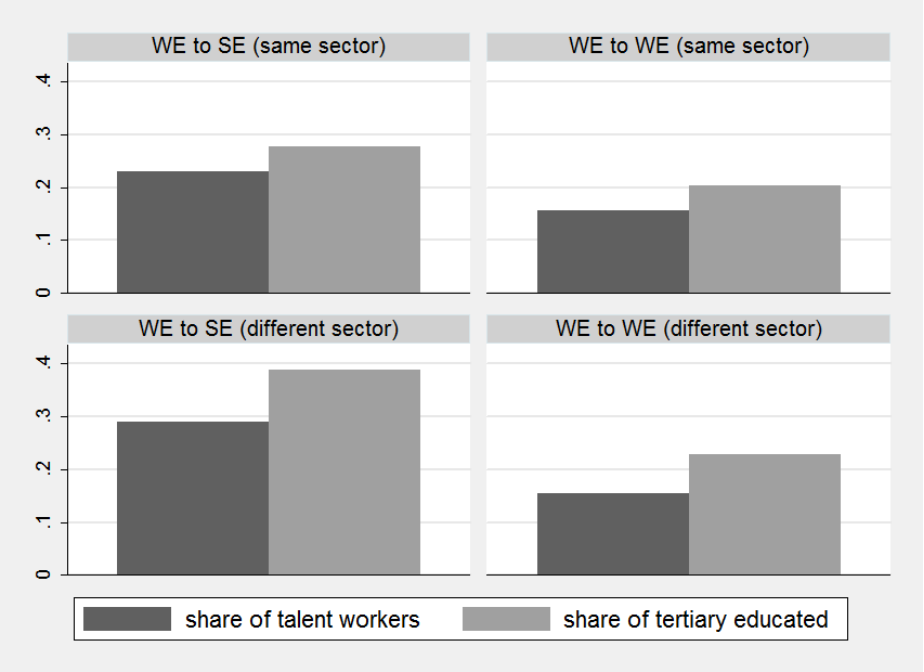
Following Hsieh et al. (2013), in this paper we place particular emphasis on the so-called *talent workers*. Completing tertiary education is a necessary but insufficient condition to be a talent worker, however. Hsieh et al. (2013) suggest to include additionally employment in one of the three top levels of ISCO code occupations (managers, professionals, technicians and associate professionals).[5]

While typically SE have lower educational attainment than WE, *talent workers* (and university graduates as well) seem to be more frequently choosing SE than changing industry, see Figure 2. This may stem from two types of effects. First, typically SE are older than the working population in total, while there are strong growing cohort effects in university enrolment in the analyzed period. More specifically, about 50% of high school graduates continued education at tertiary level in the

[3] We drop from the analysis individuals, who simultaneously run own business and maintain wage-employment, in total 1 037 observations.
[4] We drop workers who claimed that they have tenure longer than 13 months, but they changed industry sector within a year. There were only approximately 100 cases like that within quarter.
[5] Given that we require occupation, we cannot analyze flows from SE to WE or flows from inactivity/unemployment to WE/SE, since information on occupation is only recorded for the working individuals.

2000s, whereas the share of highly educated workers in population was only about 17% in the beginning of the sample. If these were disproportionally the young who start up the new business instead of changing a job, better educational attainment would be explained by pure cohort effects.

Figure 2. Share of tertiary educated and *talent workers* among workers who changed job.



Data: Polish LFS, 2001q1-2013q4. *Note:* Denominator – number of talent/tertiary educated workers who changed wage-employment/switched to SE; numerator – number of workers who changed job/switch to SE.

Second type of effect stems from our core point of interest in this paper. Our objective is to identify which economic factors explain mobility to SE – and if being a *talent worker* plays an important role in this process. Since job change is a fairly rare phenomenon, we focus on those who are prone to mobility at all.

The literature in the field emphasizes the differences between aspirational and necessity self-employment. We relate to this literature by exploring two confounding aspects which can affect the decision to become self-employed: prospects for maintaining WE within industry (as a push factor to capture 'necessity') and income attainment (as a pull factor, to capture 'aspirations'). To be sure that we are in fact catching the effect of talent occupation, we propose two robustness checks. First, if talent workers are more often employed in industries with higher worker mobility than we can observe higher mobility of talent workers to self-employment due to this mobility factor, not due to being a talent. Second, we can also suspect that *talent workers* are relatively better paid in comparison to workers with similar characteristic that are not considered 'talented'. If this is the case, then in our analysis we may mislead the effect of talent with the effect of income position.

3. Method

The interest in this paper lies in disentangling the factors which explain mobility of wage-employees into self-employment with a particular emphasis on *talent workers*. Since we are relying on LFS data, identification cannot explore the validity of instruments or psychological insights. Instead, we constructed indicators which help to identify talent workers.

We follow two identification strategies. First, we focus on individuals who within the last 12 month changed from WE to SE (SE=1) or with WE (SE=0). On this group, we will run a probit with annual, quarterly and industry fixed effects with the aim to exclude influence of labor market condition or seasonal effects on size and significance of the estimators.

Specification 1: $P(SE = 1 \,|tenure < 13\, months) = \beta * talent_j + \gamma * x_j + \delta * z_i \, + \varepsilon_j$,

where *i* – industry sector and *j* – individual. We denote individual characteristics by x_j, and industry characteristics by z_i.

Second we also analyze individuals who reported changing the industry in which they are employed. Our predicted variable takes the value of 1 if that person switched from WE to SE within the last 12 months, but – in contrast to the first specification – it takes the value of 0 for all those who report the same industry of occupation currently and last year. In this first specification we can control for industry and industry changes, which is impossible in the second specification.

Specification 2: $P(SE = 1 \,|change\ industry\ within\ a\ year) = \beta * talent_j + \gamma * x_j + \delta * z_i \, + \varepsilon_j$.

Both models have same set of basic predicting variables x_j, which includes a variety of personal characteristics, such as age, gender, education, size of residence and marital status. Given the richness of Polish LFS, we include in the regressions gender and age, as well as marital status (recoded to a dummy, taking the value of 1 for married and 0 for single, divorced or widowed). We can also control for the size of residence with three categories: those living in villages and small cities (with less than 20 thousand inhabitants), the second level is a medium size town (between 20-100 inhabitants) and third group is a large city (more than 100 thousand inhabitants). Expectedly, we also control for education and occupation. In addition, when we run the robustness checks, the model also comprises controls for a variety of mobility and productivity (income) indicators, which are computed at individual and industry levels, see sections 3.1 and 3.2 below.

One could have doubts on validity of comparing *talent workers* in self-employment and wage-employment. As being self-employed is obviously associated with being an owner of the firm it is reasonable to assume that those who are self-employed will often describe themselves as `mangers' or `directors'. Given that these occupations belong to talent occupations, following the definition suggested by Hsieh et al (2013), this would imply automatically that all self-employed with a tertiary education are classified as *talent workers*. Luckily, the instructions for Polish LFS precludes this option. In fact, interviewers are advised to classify self-employed occupation according to their actual tasks and duties rather than to what they claim. Therefore, only those self-employed whose duties are the same or very similar to wage-employed managers, are actually classified within the first occupational group according to ISCO. For example, owners of small, one-person sales firms are

considered as `sellers' and not `managers' of the firm. Indeed, in the data on average the shares of *talent workers* among wage-employed and self- employed are similar – around 20 percent.

To avoid confusing the effect of the talent workers per se, with productivity and mobility, several robustness checks are provided. We discuss them in the coming sections.

3.1. Robustness check: mobility

While SE is typically associated by relatively higher risk – especially in a country with low employment stability like Poland - SE may paradoxically offer lower uncertainty about the future. This reflects the difference between the manageable risks (such as those of running own business) as opposed to unmanageable risks (such as the risk of permanent job destruction in occupation or industry). If the sector of current employment provides stable employment, those who decide on becoming SE might look for challenges in running their own firm. Yet, if the sector is characterized by high turnover of workers – switching to SE may be in fact a form of 'flight to security'. If talent occupations were more frequent in industries with high mobility to different sectors than significance of talent worker dummy in our regression might be due to this mobility factor.

To check which intuition is correct, we constructed measures of sector mobility. For each 2 digit NACE industry we calculated a variety of turnover indicators. First, we compute gross flows in the industry at each point in time (1) and relate it to overall gross flows rate at that time. Based on this indicator, dummy for high mobility (2) is equal to one if in the sector mobility is larger than average mobility in the economy and zero otherwise. Second, we use a continuous measure: surplus of mobility is the difference between average mobility in the economy and the mobility in the sector (3). Third, we show if in the current period the industry is decreasing employment (4) or quite the opposite.[6]

$$(1)\ gross\ flow_{i,t} = \frac{number\ of\ workers\ who\ claim\ to\ change\ sector_{i,t}}{number\ of\ workers\ who\ worked\ in\ sector\ last\ year_{i,t}}$$

$$(2)\ high\ mobility\ sector_{i,t} = \begin{cases} 1, & gross\ flow_{i,t} > average\ gross\ flow_t \\ 0, & otherwise \end{cases}$$

$$(3)\ mobility\ surplus_{i,t} = gross\ flow_{i,t} - average\ gross\ flow_t$$

$$(4)\ decreasing\ employment_{i,t} = \begin{cases} 1, & number\ of\ workers_{i,t} - number\ of\ workers_{i,t-1} < 0 \\ 0, & otherwise \end{cases}$$

where i – industry sector, t – year

The mobility of workers in the economy varies largely between sectors. On average about 5% of the workers are leaving each sector every year, but there are industries in which more than one fourth of the workers lose or leave their jobs within one year. The highest mobility is observed within market services, the lowest in manufacturing.

[6] Due to significant correlation between sector's mobility indicators and income position, indicators are included in the regressions separately. Additionally, as income position is highly correlated with the size of the city where respondent is living and working (which is reasonable because in large city cost of living is higher, so wages have to be higher as well), in the specification with income indicators size of the city is omitted.

As in our first specification, we do not assume that newly self-employed individuals are choosing a different sector, yet we can observe a full picture of flows between sectors when the wage-employed person is establishing a new firm. Still, most new entrepreneurs will obviously go to the labor environment they are already familiar with. The four broad industry categories are coded as follows: manufacturing – NACE groups from B to E; construction – F; market services – from G to N; non-market services – from O to S . The tendencies are similar to those in the whole economy – new self-employed are choosing mostly market services.

Table 2. Mobility between sectors – self-employed who was wage-employed year ago

		Industry before switching to self-employment				
		manufacturing	construction	market services	non-market services	**total**
Industry in which own firm is operating	manufacturing	**6.9%**	2.9%	9.1%	0.7%	**19.6%**
	construction	0.7%	**16.3%**	2.5%	0.1%	**19.5%**
	market services	1.4%	2.3%%	**40.7%**	1%	**45.3%**
	non-market services	0.3%	0.5%	6.1%	**8.6%**	**15.6%**

Data: Polish LFS, 2001q1-2013q4. Market services include NACE sections G to N, non-market services include sections O to S. The denominator is the number of workers who switched from WE to SE.

3.2. Robustness check: income

Neither earned income last year, nor incomes when self-employed are available from Polish LFS, so it is impossible to compute returns to self-employment, but relying on labor market insights we compute measure of relative income position. We run a simple Mincerian regression with age, gender, residence, industry, education and occupation. [7] Based on the obtained coefficients, we compute the fitted wages and the residuals within the reference groups. These values are imputed to our individuals. For the fitted wages we compute relative measure (percentile) – the relative income position in larger groups with the same characteristics (age group, gender, residence, education level). This measure will provide information about income / productivity position of the person among similar people. Fitted values were calculated for much more detailed division, so the distributions for groups used to calculate percentiles would make sense.

(1) $income\ percentile_{j,k} = \int_{o}^{\widehat{wage}_j} f_k(t)dt,$

where $f_k(t)$ is the probability density function of wages in group k-people in the same age group, with the same education level, gender, residence and $\widehat{wage}_j$ is the fitted value of wage for individual j which we obtain from a standard Mincerian regression.

While on average residuals are zero, within reference groups there are departures. Positive residuals are indicative of this group being paid more than implied by the characteristics, while the opposite holds for the negative residuals. Tyrowicz (2011) identifies that wage-employees who switch into self-employment were *overpaid* relative to those who have not switched already prior to becoming self-employed, but this holds true only for the aspirational self-employed and not for

[7] Estimates for the log of hourly wage, no self-employed, no selection correction. Estimates separate for each year.

entire population (identification of aspirational SE is based on the ability to create jobs). In this study we compute the relative frequency of negative and positive residuals (6) as well as average residual, to capture the dispersion in overcompensation and undercompensation within the reference groups.

$$(2)\ \ overpaid\ group_k = \frac{number\ of\ positive\ residuals_k - number\ of\ negative\ residuals_k}{number\ of\ group\ members_k},$$

where *k* is group people in the same age group, with the same education level, gender, residence.

Distribution of the fitted wages calculated based on the simple Mincerian equation (see Figure 1 in the Appendix) shows that between workers who changed jobs there are relatively more people with characteristics of average-paid workers than in the whole working population. Newly self-employed individuals have more often assigned wages connected with higher productivity. There is also more dispersion inside the group, but the differences are indeed small.

4. Results

In our study we focus on the choice to become self-employed in comparison to changing jobs within wage-employment. Consistent with the findings of the earlier literature, our results confirmed intuition about correlation between basic demographics and the decision about becoming self-employed. Women are less likely to choose self-employment than men. Married people are more prone to enter own firms. The relationship between age and willingness to start an own business is an inverted U-shaped. Establishing a new firm is more popular in larger cities where there are more business opportunities and infrastructure is well-developed. Table 3 and 4 for Specification 1 and 2, respectively, demonstrate that in fact *talent workers* have a higher probability of becoming self-employed. A positive correlation between switching to self-employment and being considered a *talent worker* is strongly significant in both specifications, regardless of controls included in the model. The estimates of the marginal effects are stable across specifications, yielding the probability of approximately 5 to 10 percent higher for the *talent workers* than other university graduates. The effects is statistically the same for men and women, which additionally strengthens the aspirational rather than necessity interpretation of the choice to become self-employed.

In the second specification (see Table 4) we can also include controls for a change in the industry of occupation/activity. Thus, we are able to test if those who switch to self-employment are more likely to do so in the different industry, whereas changes of employer are more likely to occur within industry. This result suggests that in terms of skills, wage-employment is only sometimes a form of preparation/training before self-employment.

4.1. Robustness check: results

The effect of *talent workers* turns out to be significant in each robustness check. Even the size of the marginal effect was stable in each specification. Adding interaction between our mobility and income position variables and talent occupation also did not affect the results. This proves that indeed talent workers are more likely to become self-employed. We checked that the result was not

an effect of characteristics possibly connected with being talent worker – high mobility within the sector or income position among similar workers.

Robustness checks allow us to discover additional effects - wage-employees who were working in the sectors with high sector's mobility are more likely to switch to self-employment than to find a job in the different sector of wage-employment, column (2). There is no significant effect of a decrease in the employment level of a given sector on the decision to start own firm. There is an equal chance for the person to choose self-employment or switch to wage-employment in a different sector of industry, even if there are more workers fired than hired within that sector at the given time. This means that self-employment in Poland is not necessarily a sector where workers who just lost their job, or are afraid to lose it, are escaping.

In case of relative income position, belonging to the group with higher income position in comparison to similar workers does not affect probability of starting own firm. We used income percentiles as an approximation of productivity of each worker who decided to change job, but it turns out that newly self-employed individuals are not different from those who are wage-employed when it comes to assumed productivity. Both positive residuals and relative frequency of positive and negative residuals within the group with the same characteristics are positively correlated with the start-up decision. This indicates that workers who become self-employed are more likely to belong to the group considered to be 'overpaid' than those workers who change jobs within wage employment.

Table 3. Talent workers drives self-employment entry – marginal effects from probit regressions (specification 1)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
talent occupation	**0.05*** **	**0.05*** **	**0.04*** **	**0.04*** **	**0.05*** **	**0.05*** **	**0.05*** **	**0.05*** **
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
interaction: female and talent occupation	-0.01	-0.01	-0.01	-0.00	-0.01	-0.00	-0.00	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
different industry		0.01***						
		(0.00)						
high mobility sector			0.02***					
			(0.00)					
mobility surplus				1.27***				
				(0.12)				
lower employment					0.00			
					(0.01)			
income percentile						-0.00		
(within the group with similar characteristics)						(0.00)		
average residual							0.12***	
							(0.03)	
overpaid group								0.01**
								(0.01)
married	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
age	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
age^2	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
female	-0.02***	-0.02***	-0.02***	-0.02***	-0.02***	-0.02***	-0.02***	-0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
medium size city (20-100 thousand inhabitants)	0.01**	0.01**	0.01**	0.01*	0.01**			
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)			
large city (above 100 thousand inhabitants)	0.01***	0.01***	0.01**	0.01**	0.01***			
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)			
year and quarter dummies	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED
industry categories	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED
Observations	23,383	23,369	23,383	23,383	23,383	18,968	23,383	23,383

Dependent variable: self-employed among those with tenure shorter than 13 months

Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; table shows marginal effects from probit models; variable size of the city excluded from specification (5), (6) and (7) due to collinearity with income percentile and average residual variables; years: 2001-2013

Table 4. Talent workers drives self-employment entry – marginal effects from probit regressions (specification 2)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
talent occupation	**0.09*** **	**0.10*** **	**0.10*** **	**0.09*** **	**0.10*** **	**0.11*** **	**0.12*** **
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
interaction: female and talent occupation	-0.03*	-0.03**	-0.02	-0.03*	-0.02	-0.02	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
sector with high mobility		0.11***					
		(0.01)					
mobility surplus beyond the mean mobility			3.93***				
			(0.22)				
lower employment in the sector				0.01			
				(0.01)			
income percentile within the group with similar characteristic					-0.00		
					(0.00)		
average residual						0.38***	
						(0.09)	
overpaid group							0.05***
							(0.02)
married	0.05***	0.05***	0.05***	0.05***	0.05***	0.05***	0.05***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
age	0.02***	0.02***	0.02***	0.02***	0.03***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
age^2	-0.03***	-0.03***	-0.03***	-0.03***	-0.03***	-0.03***	-0.03***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
female	-0.03***	-0.03***	-0.03***	-0.03***	-0.04***	-0.03***	-0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
medium size city (20-100 thousand inhabitants)	0.02**	0.02**	0.02*	0.02**			
	(0.01)	(0.01)	(0.01)	(0.01)			
large city (above 100 thousand inhabitants)	0.03***	0.03***	0.02**	0.03***			
	(0.01)	(0.01)	(0.01)	(0.01)			
year and quarter dummies	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED
Observations	9,716	9,660	9,660	9,660	7,590	9,716	9,716

Dependent variable: self-employed among those who switched to self-employment or changed industry of occupation

Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; table shows marginal effects from probit models; variable size of the city excluded from specification (5), (6) and (7) due to collinearity with income percentile and average residual variables; years: 2001-2013

4.2 Talent worker and field of education

Finally, we wonder if the effect of talent occupation is affecting probability of becoming self-employed in the case of workers with different education background. As from 2004 respondents in Polish Labor Force Survey are asked about the field of education in which they have reached the highest level of education – we used this information and divide our sample into field subsamples. For simplification we distinguished five large groups: STEM (Science, Technology, Engineering, Mathematics), humanities (philology, literature, arts), social sciences (law, economics, sociology), services and health (and social assistance). On these subsamples we separately run basic regression. The results from both specifications show that role of talent occupation depends strongly on the workers field of study, see Table 4.

Table 4. *Talent workers* drives self-employment entry, but only in STEM and health fields – marginal effects from probit regressions within fields of education.

	STEM		humanities		social sciences		services		health	
VARIABLES	(S1)	(S2)	(S1)	(S2)	(S1)	(S2)	(S1)	(S2)	(S1)	(S2)
talent occupation	**0.06*** **	**0.13*** **	**-0.01**	**0.01**	**0.01**	**0.03**	**-0.01**	**-0.04**	**0.11***	**0.67*** **
	(0.01)	(0.03)	(0.03)	(0.05)	(0.01)	(0.03)	(0.03)	(0.06)	(0.06)	(0.17)
interaction: female and talent occupation	-0.01	-0.04	0.01	0.02	0.04*	0.04	0.08	0.13	-0.04	-0.21***
	(0.02)	(0.04)	(0.03)	(0.07)	(0.02)	(0.04)	(0.07)	(0.13)	(0.04)	(0.08)
married	0.03***	0.06***	-0.02	-0.01	0.01	0.03	0.01	0.04	0.03	0.11
	(0.01)	(0.01)	(0.02)	(0.04)	(0.01)	(0.02)	(0.01)	(0.03)	(0.02)	(0.07)
age	0.01***	0.02***	0.01**	0.03**	0.02***	0.04***	0.01***	0.03***	0.01*	0.05***
	(0.00)	(0.00)	(0.01)	(0.02)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.02)
age^2	-0.00***	-0.03***	-0.00**	-0.04*	-0.00***	-0.05***	-0.00***	-0.05***	-0.00	-0.05**
	(0.00)	(0.01)	(0.00)	(0.02)	(0.00)	(0.01)	(0.00)	(0.02)	(0.00)	(0.02)
female	-0.02**	-0.05**	-0.04	-0.06	-0.08***	-0.14***	-0.01	-0.01	-0.01	0.06
	(0.01)	(0.02)	(0.03)	(0.06)	(0.02)	(0.03)	(0.01)	(0.03)	(0.04)	(0.08)
medium size city	0.01*	0.03	0.02	0.05	-0.00	-0.01	-0.01	-0.03	0.02	0.18
	(0.01)	(0.02)	(0.02)	(0.05)	(0.01)	(0.02)	(0.01)	(0.03)	(0.03)	(0.11)
large city	0.02***	0.04**	0.05**	0.07*	0.01	0.01	0.00	0.01	0.00	0.03
	(0.01)	(0.02)	(0.02)	(0.04)	(0.01)	(0.02)	(0.01)	(0.03)	(0.02)	(0.07)
Observations	8,715	3,392	1,006	444	3,127	1,555	1,927	767	546	176

Dependent variables: (1) self-employed among those with tenure shorter than 13 months; (2) self-employed among those who switched to self-employment or changed industry of occupation

Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; table shows marginal effects from probit regressions; years: 2004-2013

The results show that in fact the talent occupation effect is driven by workers educated in two fields: STEM and health. It means that tertiary educated graduates in these fields establish own firms more often than secondary school graduates in the same fields. Yet, in social sciences, services and humanities tertiary and secondary school graduates exhibit no differentiation in propensity to become self-employed or to change a job within wage employment.

4.3. Are talent workers potentially more successful as entrepreneurs?

Our study benefits greatly from the concept of *talent workers* created by Hsieh et al. (2013). According to the definition, *talent workers* have higher potential to be creative – the tertiary education and occupational position are signals of these special abilities. To verify that this actually translates to higher rates of success, we explore additional information available in Polish LFS: self-reported data on creating jobs for the others. As demonstrated earlier – see for example Estrin et. al (2013) – creating new jobs is closely associated with e.g. financial success of the firm. While the information on actual number of posts is unavailable, all self-employed report if they hire additional workers. Using data on all self-employed outside agriculture we run a probit model:

Specification 3: $P(creating\ jobs\ |SE = 1) = \beta * talent_j + \gamma * x_j + \varepsilon$,

where j denotes individuals. In the first specification we include only *talent worker* dummy and year and quarter effects. Second specification is much richer in a sense of number of variables included. It takes into consideration education level, occupation, age, gender, residence, marital status, industry, year and quartile.

Table 5. Talent workers are more likely to become an employer - marginal effects from probit regression

VARIABLES	(1) creating jobs	(2) creating jobs
talent occupation	0.28***	0.03***
	(0.01)	(0.01)
occupation	NO	YES
age	NO	YES
age^2	NO	YES
female	NO	YES
residence	NO	YES
married	NO	YES
year and quarter	YES	YES
Observations	82,623	82,623

Dependent variable: employer among all self-employed outside agriculture
Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; table shows marginal effects from probit regressions; years: 2004-2013; sample consists of all self-employed in Polish LFS who answered question about employing other people in the firm.

Indeed, *talent workers* more often create additional jobs than non-talent workers who become self-employed (see Table 5). Even if we control for occupation and education level – being a talent worker is still positively and significantly correlated with the probability of creating jobs. *Talent workers* are, thus more likely to create new workplaces. This confirms the intuition, that *talent workers* – if they become self-employed – create more frequently the economically desired type of entrepreneurial sector.

5. Conclusions

There are two ways of looking at self-employment: it is either a part of the economy where the new ideas are created and implemented or the second-class category of employment for people who are not able to keep or get a job within wage-employment. For entrepreneurship to enhance innovativeness, it a necessary condition – though probably not a sufficient one – to attract individuals with a potential to create new value. A way to operationalize this group has been proposed by Hsieh et al. (2013) and relies on the so-called *talent workers*. Again, it is not sufficient to attract talent workers to become entrepreneurs (they also need to succeed), but if the empirical data suggested talent workers who want to change a job are less likely to become entrepreneurs than other workers, the structural effects would work against the strength of the link between entrepreneurship and innovation. In this paper we analyzed empirically if and to what extent talent workers contribute to the start-ups. We do so in the context of Poland, which is a fast growing economy with relatively high self-employment rates. We analyzed the individual job flows data for over a decade to compare the decision to start-up a new business with the decision to move to a different employer/occupation/industry.

Our findings suggest that in Poland, when it comes to the decision of changing job, *talent workers* are more likely to establish new firm than other workers. This result is robust to several checks proving that we are not confusing effect of *talent workers* with industry specific mobility, job destruction, relative incomes or relative productivity of the worker. Even though talent workers have special place on the wage-employment labor market, it does not affect the relationship between entering self-employment and being high-skilled and well-educated.

While the result is robust, it seems also to be specific to few specializations. The correlation between probability of starting own firm and being a talent worker is driven only by workers graduated in two fields of study: STEM and health. This is potential gap on the market which could be reduced. Policy makers should take a closer look at occupations and firms performing in different sectors than those dominated by STEM and health graduates, who seem to be already prepared to working on their own.

Finally, we find that talent workers are not only potentially more likely to establish their own firm, but that they are also more likely to create new jobs. This may be indicative of aspirational self-employment being more prevalent in this group. However, perhaps the barriers to creating own business vary for different fields of education (e.g. educational programs or business regulations). Thus, it seems that further research is needed to identify the effective ways of stimulating *talent workers* with education in other fields to become entrepreneurs.

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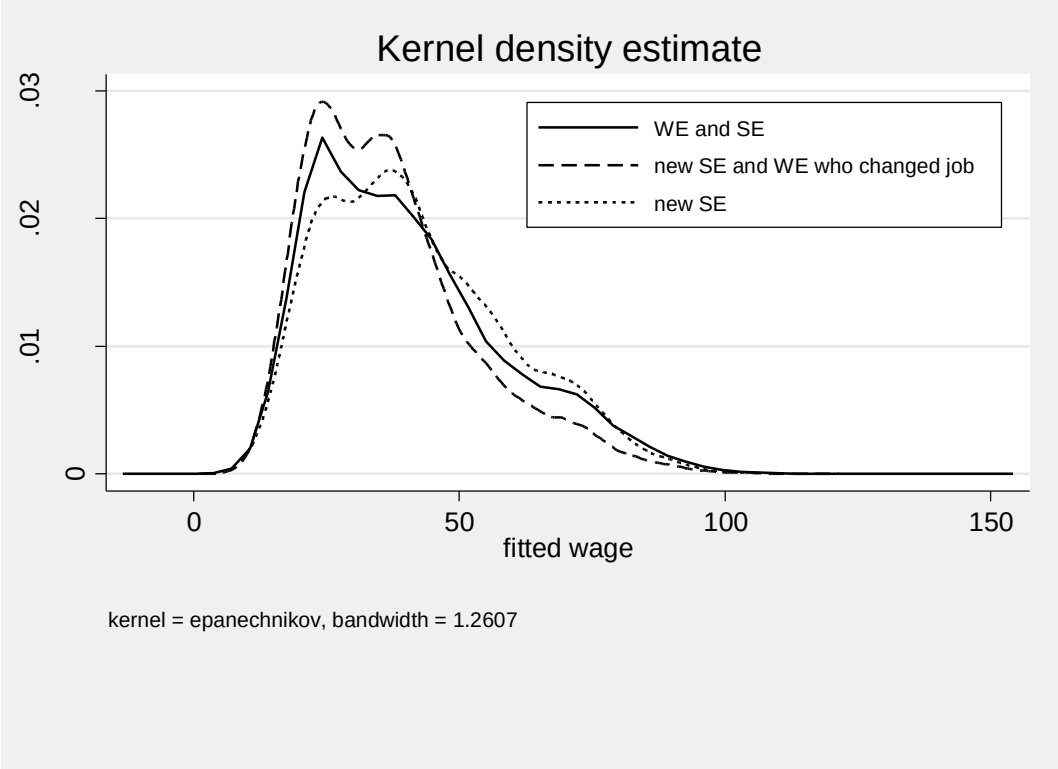
Appendix

Figure A1. Distribution of fitted wages (in whole working population, for those who changed job and switched to self-employment)



Data: Polish LFS, 2001q1-2013q4.

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