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## Does a change of occupation lead to higher earnings?\*

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### **Abstract**

The aim of this paper is to identify how the mobility between different types of broadly defined occupation (hired work, self-employment in industry, services and agriculture or social security beneficiaries) changes personal income of individuals. We apply the Markov matrices to the panel data on 30540 individuals for 2007-2008 from the Polish Household Budget Surveys. Our hypothesis is that a change of occupation affects individual capability to earn income, controlling for the occupation a person quits and the occupation a person starts, as well as age, education level and a permanent or temporary character of work. We test our hypothesis using the regression analysis. Our results show that the inter-occupational mobility matters mostly for those quitting hired work for self-employment, for the better educated, as well as for respondents above 60 years of age.

Keywords: income, earning, mobility, occupation, hired work, self-employment

JEL: D11, D12, D14

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## **1. Introduction**

Earning capability of an individual depends on the level and quality of human capital and the occupation a person performs as well as social and cultural relations in which the process of earning takes place. The hidden individual and social capabilities of earning can be measured by their influence on manifest variables like education or occupation.

In the neoclassical economics the consumer is rational and maximizing utility. The standard consumption theory of life cycle and the permanent income theory (Modigliani 1986; Friedman 1957) assume that income is earned to smooth consumption during the life cycle or in conceivably long periods when consumers can assume that their income will be relatively stable. The type and place of work or occupation affect income uncertainty, f. ex. income earned in agriculture is treated as less stable than income earned in industry or services.

The human capital theories (Becker 1994; Arrow 1962; Mincer 1974; Schultz 1971; Ben Porath 1967) view earnings as the outcome of utilization of skills and capabilities accumulated in individuals during the period of education, training and learning by doing in the process of production. The human capital earning function of Mincer (1974) shows the positive correlation of earnings and the level of human capital expressed in years of schooling and years of experience or age (if training and experience cannot be fully observed in age groups). Earnings are also dependent on the signaling value of a school or university diploma which is treated at the labor market as a pure signal independent from skills that it should prove (Spence, 1973).

Gary Becker (1994, third edition) points to the importance of on-the-job training for increasing human capital of employees and hence their productivity and earnings. Training can be of general character or specific to a particular firm, but in both cases it is strongly connected to the work place.

Particular skills gained from education and training may be utilized differently in occupations that are performed by individuals. This may lead to earning differences of workers (with similar human capital and age) who are economically active in different sectors and occupations. Thus, earnings are a function not only of education, experience and age, but also of the type of economic activity in which the person acts as employee, self-employed (in industry, services, agriculture), unemployed or retiree.

The earning capability depends also on individual expectations or desires of a preferred income (Liberda 2007). If a person perceives personal income as insufficient for individual and family needs she or he may make a decision to increase earning by a change of occupation or a place of work within a country or between countries (Milanovic 2008).

In this paper we analyze the inter-occupational mobility of individuals and the change of personal income when they quit one type of broadly defined occupation and enter another occupation. The analysis is based on the panel data for 30,540 respondents from the 2007-2008 Polish Household Budget Surveys. We apply the Markov mobility matrices and the regression analysis to account for the increase or decrease of personal income when the occupation is changed by individuals grouped by age, education level, as well as the permanent or temporary character of work.

## **2. Data**

The data concern 30,540 individuals who were surveyed in the same month during two consecutive years (2007-2008) in the Polish Household Budget Surveys and thus constitute a panel. Since 1993 household budget surveys in Poland have been based on the monthly rotation method. The monthly rotation assumes that one household participates in the survey for one month in a year, and then, part of households participate in the survey in the corresponding month of the following year. Until 2000, 50% of randomly selected households participated in surveys for 4 consecutive years (constant sample) and 50% of households participated in surveys only once (variable sample). It enabled to create four-year panels of households.

Since 2001 the same households have been surveyed only for two consecutive years. In 2007, the following two independent subsamples selected in 2005 were surveyed:

- subsample 1 for the surveys in 2006-2007,
- subsample 2 for the surveys in 2007-2008.

It means that, during one year, half of surveyed households are exchanged. Currently, during one year, over 30 000 households are surveyed, which is about 0.25% of the population. In selected households all persons included in the household participate in the survey. The person at the age of 16 and over who gains the highest income of all the household members is a reference person.

Household's net disposable income is defined as a sum of all household members' current incomes from various sources reduced by prepayments on personal income tax and by social security and health insurance contributions. The household disposable income covers also an estimated value of income in kind (e.g. natural consumption) as well as goods and services received free of charge, e.g. social security benefits and gifts received from other households. The main sources of income are:

- income from hired work,
- income from a private farm in agriculture,
- income from self-employment (outside a private farm in agriculture or from free profession),
- income from property or from rental of a property or land,
- social security benefits (old age pension, disability pension or family pension),
- other social benefits,
- other income (including gifts and alimonies).

The main source of maintenance is defined as the only or prevailing source of maintenance. A person who does not have her/his own source of maintenance (either earned or unearned) and is maintained by other members of the household is a dependent.

The panel of households created in 2007-2008 consists of 15,853 households (unweighted sample). To analyze incomes of households' members, we created a panel of persons included in surveyed households. The panel of individuals included the persons who were members of the households in 2007 as well as in 2008, and were at the age of 19 or more in 2007.

The 2007-2008 Panel of individuals (members of households) consists of 30,540 persons.

For this research we used the net personal income of individuals measured in nominal terms in the same month in 2007 and 2008. Occupation of a person was defined by her/his main source of income which was the main source of maintenance for this person.

### **3. Markov mobility matrices**

Table 1 shows the structure of a surveyed panel by persons' main source of maintenance in 2007 and 2008, respectively. We see that among persons 19 years old or more the dominating source of maintenance is hired work (40% of the total number of respondents in the sample) and old age or disability pension (one third of the sample). The rate of persons being dependent is about 10% of the 2007-2008 sample. Principally, they are pupils or students.

Socio-economic changes in the last years in Poland have created the necessity for people to change the main source of maintenance. Some of these changes are caused by retirement or entrance into the labor market. Others changes of occupation are unplanned and result from the climate on the labor market or random events, e.g. loss of work and transition to unemployment benefits or dependency on other members of the household, transition to a disability pension by a working person etc. Very interesting is the analysis of a change of a form of employment from hired work to self-employment or vice versa. In the 2008 household survey a category "hired work" (permanent and occasional) was divided into two subcategories: work in the country of origin and work abroad.

Table 1. Structure of respondents by a source of income in a panel of individuals 2007-2008

Source of income	2007	2008
Employment		
hired permanently	38,3	40,3
hired occasionally	1,4	1,1
Farm	5,8	5,6
Self-employment	4,8	4,8
Pensions	32,0	33,0
Other social benefits	5,1	4,2
Other income	1,2	1,1
Dependents	11,5	9,9
Total	100,0	100,0

Source: Household Budget Surveys, 2007-2008, Panel of individuals, Poland, Central Statistical Office, Warsaw.

In 2008, 1.5% out of permanent workers worked abroad. In a much smaller group of part-time workers, one fourth of them worked abroad (Table 2).

Table 2. Mobility of respondents between different occupations (source of income) in a panel of individuals 2007-2008

2008	Employment hired permanently at home country	Employment hired occasionally permanently abroad	Hired work occasionally at home country	Hired work occasionally abroad	Farm	Self-employment	Pensions	Other benefits	Other income	Dependents	Total
Employment hired permanently	10564	166	41	15	39	119	240	225	43	248	11700
Employment hired occasionally	172	12	131	7	14	10	12	9	6	49	423
Farm	101	9	17	5	1544	17	36	18	1	35	1782
Self-employment	123	6	12	1	12	1240	27	8	4	22	1454
Pensions	130	1	4	1	22	14	9491	57	17	27	9763
Other benefits	289	4	26	1	14	12	185	810	26	180	1546
Other income	70	4	10	2	5	12	14	19	192	34	361
Dependents	640	16	68	6	59	51	59	126	54	2431	3510
Total	12090	218	309	37	1708	1474	10064	1272	342	3027	30540

Source: Household Budget Surveys, 2007-2008 Panel of individuals, Poland, Central Statistical Office, Warsaw.

Most of the respondents are maintained from hired work and old-age/disability pensions. For persons for whom hired work was the main source of income in 2007, this source of maintenance remains unchanged in 90% of cases in 2008.

Only 1% of the hired workers in 2007 started acting as self-employed in 2008, namely 129 persons out of 12123 of the total number of hired workers in 2007 (Tables 2 and 3). Similar number of the self-employed moved to hired work in 2008, namely 142 persons out of 1454 of the total number of

self-employed in 2007. They constituted 10% of the total number of self-employed in 2008 (Tables 2 and 4).

Table 3. Mobility of respondents from hired work to other occupations in a panel of individuals 2007-2008 (in %)

2008 Source 2007	Hired work	Farm	Self-employment	Pensions	Other benefits	Other income	Dependents	Total
Hired work	91,6	0,4	1,1	2,1	1,9	0,4	2,4	100,0

Source: Household Budget Surveys, 2007-2008 Panel of individuals, Poland, Central Statistical Office, Warsaw.

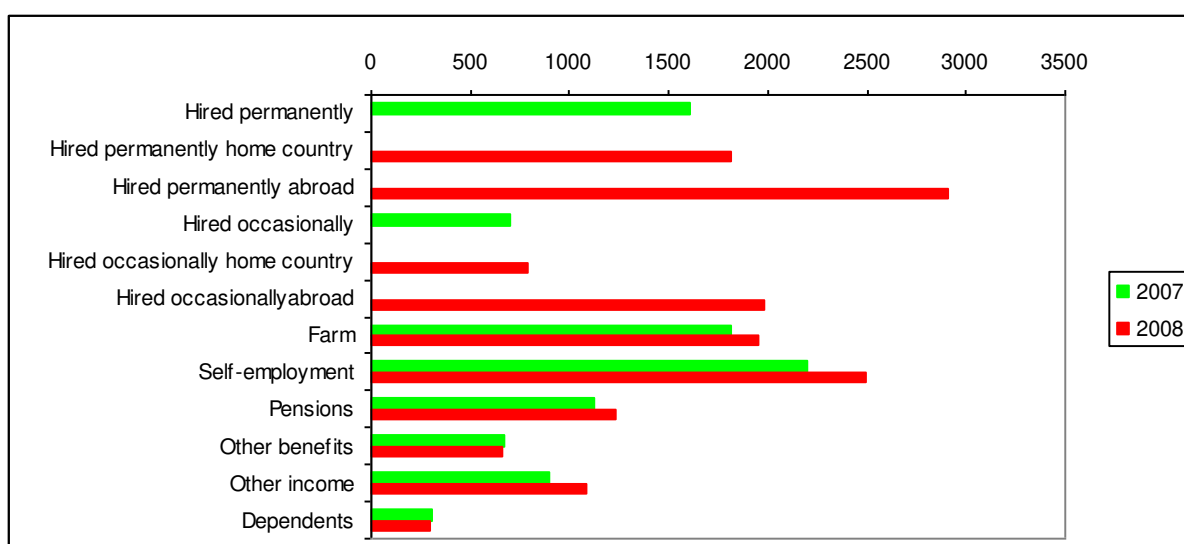
Table 4. Mobility of respondents from other occupations to hired work in a panel of individuals 2007-2008 (in %)

2007 Source 2008	Hired work	Farm	Self-employment	Pensions	Other benefits	Other income	Dependents	Total
Hired work	87,8	1,0	1,1	1,1	2,5	0,7	5,8	100,0

Source: Household Budget Surveys, 2007-2008 Panel of individuals, Poland, Central Statistical Office, Warsaw.

Working abroad gives permanent workers 50% more income than income earned in their home country. Part-time workers earn more than twice as much abroad as at home. However, moving to another country is related to a higher risk of becoming unemployed and other risks related to unknown labor market institutions and rules, including language requirements (Figure 1).

Figure 1. Average monthly personal income by occupation in a panel of individuals 2007-2008 (in zlotys)



Source: Household Budget Surveys, 2007-2008 Panel of individuals, Poland, Central Statistical Office, Warsaw.

The highest increase in personal income was observed when respondents switched from hired work in 2007 to a self-employment activity in 2008. It says that a risky decision to start one's own business proved to be profitable, although only for a very small group of respondents (Table 5).

Young people in the age group of 30-39 are those mainly involved in switching from hired work to self-employment. Older respondents (50-54) more often benefit from the social security system than from self-employment. When hired employment is discontinued, due to either individual reasons or due to structural unemployment, it is more difficult to start one's own activity at an older age than at a young age (Tables 6 and 7).

Table 5. Increase in personal income by a change of occupation in a panel of individuals 2007-2008 (in zlotys)

Source of income in 2007 (from)	Increase in personal income					
	Source of income in 2008 (to)					
	Hired work	Farm	Self-employment	Pensions	Other benefits	Dependents
Hired work	290	-139	594	126	-481	-414
Farm	486	145	9	-527	-96	-352
Self-employment	270	762	255	-396	-491	-298
Pensions	695	627	1053	93	-238	-508
Other benefits	497	-38	552	355	19	-111
Dependents	794	521	594	657	237	71

Source: Household Budget Surveys, 2007-2008 Panel of individuals, Poland, Central Statistical Office, Warsaw.

Table 6. Mobility of respondents from hired work to other occupations and from other occupations to hired work, by age groups, in a panel of individuals 2007-2008

	Age group										Total
	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	
From hired work											
to self-employment	8	15	30	21	18	18	14	6	1		129
to other benefits	24	42	36	26	25	26	40	14	1		234
To hired work											
from self-employment	6	19	28	16	24	18	19	8	2		141
from pensions	26	12	5	13	2	14	18	25	17	4	135
from other benefits	47	58	45	38	38	27	41	23	2		319
dependents	268	142	77	56	61	49	48	18	4		724
Total	380	288	221	168	168	151	179	93	28	4	1683

Source: Household Budget Surveys, 2007-2008 Panel of individuals, Poland, Central Statistical Office, Warsaw.

When mobility from other occupations (types of economic activity) to hired work is concerned, the picture is more diversified. When available, hired work is attractive for young respondents at the age of 30-34 and 40-44, who tried a self-employment activity but decided to switch to hired work due to either lack of profits or a will to reduce risk – a disadvantage of such an activity.

There is also a relatively large group of respondents who got employed in 2008 being at the pre-retirement age (55-59 years) and whose main income in 2007 was a pension. In 2008, they earned mainly from wage employment. The pre-retirement and retirement age in Poland are relatively low (55/60 for women and 60/65 for men), and the effective retirement age is even lower by 2-3 years

below the limits. Many people benefit from the pension system and work extra, either legally or illegally.

Table 7. Increase in personal income by mobility from hired work to other occupations and from other occupations to hired work, by age groups, in a panel of individuals 2007-2008 (in zlotys)

	Age group										Total
	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	
From hired work											
to self-employment	804	522	1240	1358	30	261	-468	36			594
to other benefits	-387	-364	-1305	-320	-402	-206	-299	-386			-481
To hired work											
from self-employment	269	381	359	406	49	236	189	250	558		270
from pensions	781	472	516	789	-109	585	934	327	1090	1038	695
from other benefits	552	518	444	490	480	353	492	702	19		497
dependents	651	938	877	709	585	1263	554				794
Total	444	330	208	491	164	300	195	279	847	1038	315

Source: Household Budget Surveys, 2007-2008 Panel of individuals, Poland, Central Statistical Office, Warsaw.

Legal employment of early retired persons is allowed in Poland up to some limits of earned income. The data show that for many respondents such a solution was profitable, and they earned more from wage employment than from a pension or they could postpone their pensions for some time.

Looking at the mobility by respondents' educational levels, we see that two groups of respondents: those with primary and with vocational education were prone to moving from hired work to self-employment. They took risks and earned mainly from their own business in 2008, as opposed to wage employment in 2007. Respondents with secondary education are not mobile (Table 8).

Table 8. Mobility of respondents from hired work to other occupations and from other occupations to hired work, by educational levels, in a panel of individuals 2007-2008 (% of persons working)

	Level of education in 2008					Total
	Primary	Vocational	Secondary	Tertiary	Total	
From hired work						
to self-employment	1.3	1.1	0.	1.2	1.1	
to other benefits	4.5	2.7	1.7	0.5	1.9	
To hired work						
from self-employment	13.8	12.9	1.8	4.7	3.6	
from pensions	0.4	1.7	2.3	2.0	1.4	
from other benefits	12.9	19.9	21.9	49.5	20.6	
from dependents	14.3	22.0	19.7	32.9	20.6	

Source: Household Budget Surveys, 2007-2008 Panel of individuals, Poland, Central Statistical Office, Warsaw.

Mobility in the opposite direction, from other activities in 2007 to hired work in 2008, concerned also mainly the primary and vocational education groups. The group of persons with tertiary education is relatively smaller than other educational groups, but it is mobile at a comparable scale (Table 8).

The highest increase in personal income by mobility from hired work in 2007 to self-employment in 2008 was gained by young people (30-39 years of age). Persons at the age of 50-54 years suffered a



loss in 2008 moving in the same direction. It seems that starting one's own business may be more risky for older than for younger persons (Table 9).

Table 9. Increase in personal income by mobility from hired work to other occupations and from other occupations to hired work, by educational levels, in a panel of individuals 2007-2008 (in zlotys)

	Level of education in 2008				
	Primary	Vocational	Secondary	Tertiary	Total
From hired work					
to self-employment	422	68	652	1291	594
to other benefits	-54	-329	-930	-326	-481
To hired work					
from self-employment	89	217	305	339	270
from pensions	553	657	703	904	695
from other benefits	384	397	569	678	497
dependents	681	941	641	904	794
Total	283	215	268	688	315

Source: Household Budget Surveys, 2007-2008 Panel of individuals, Poland, Central Statistical Office, Warsaw.

A move in the opposite direction to hired work seems to be the most beneficial for persons at the age of more than 60 or even more than 65, when they undertook the wage employment in 2008, having lived previously (in 2007) off a pension. Here, the experience and competence would matter.

However, the increase in income caused by mobility from wage employment to self-employment was the highest in a group of persons with tertiary education. It proves that highly educated persons start activities that pay the most. Respondents with secondary education moving from hired work to own business increased their income by the half of the increase of those with tertiary education. And those with vocational education earned only slightly by switching from wage to self-employment.

When shifting to hired work from other activities, similar trends were observed with tertiary-educated respondents, earning the most when they switched from pension or from self-employment to wage employment. But the persons with secondary and vocational education also benefited relatively well by moving in the same direction (Table 9). Again, it proves that it is profitable to work even when one has the right to obtain a pension. And when one's own business is not profitable enough, it is better to move to wage employment than to experience losses. Mobility matters. And mobility of the more educated matters more.

#### 4. Regression analysis

For a calculation of a model we have chosen a panel of 3095 individuals who changed their occupation (and their main source of maintenance) between 2007 and 2008. We have omitted persons who became dependents because of insignificant number of persons in some subgroups by age and education.

In the linear regression model, a dependent variable *dincome* is an increase in net personal income of individuals who changed their occupation. Incomes are counted nominally in the same month of the survey in 2007 as well as in 2008. An increase in income is a difference of personal net income between 2008 and 2007.

Independent variables consist of indicator (binary) variables describing:

- change of the main source of maintenance,
- respondents' education groups,
- respondents' age groups.

Apart from that, one continuous variable *income* enters the set of independent variables – a net personal income of individuals (members of the households) in 2007.

Variables *agr\_hw*, *soc\_hw*, *pen\_hw*, *mt\_hw*, *hw\_sem*, *hw\_pen*, *hw\_soc*, *sem\_agr*, *sem\_hw* are equal to 1 when the respondent has changed her/his main source of maintenance:

*agr\_hw* from work in a rural farm to hired work,

*soc\_hw* from social security to hired work,

*pen\_hw* from pension to hired work,

*mt\_hw* from maintenance as dependent to hired work,

*hw\_sem* from hired work to self-employment,

*hw\_pen* from hired work to a pension,

*hw\_soc* from hired work to another type of social security, respectively.

*sem\_agr* from self-employment to work in a rural farm,

*sem\_hw* from self-employment hired work.

Otherwise these above mentioned variables are equal to 0.

Variables *edu\_ter*, *edu\_sec*, *edu\_voc* are equal to 1 when a person reports higher, secondary or basic vocational education, respectively. Primary education is a reference category. In this case, for a person with primary education variables *edu\_ter*, *edu\_sec*, *edu\_voc* are set to 0.

Variables concerning age are equal to 1, when (respectively)

*age35\_49*, for age 35-49

*age50\_59*, for age 50-59

*age60plus*, for age 60 and more

The age group 20-34 is a reference category.

There were 3095 observations taken into account in the estimated model. The determination coefficient is equal to  $R^2 = 0.533$ . The variable *edu\_voc*, is not significant at the significance level  $\alpha = 0.1$ . The rest of explanatory variables are significant at the level  $\alpha = 0.02$ .

Table 10. Results of the regression of an increase in personal income on a change of occupation of individuals between 2007 and 2008

Variable	B	Std. Error	p-value
<i>agr_hw</i>	648.58	137.95	< 0,001
<i>soc_hw</i>	305.04	85.79	< 0,001
<i>pen_hw</i>	811.39	113.37	< 0,001
<i>mt_hw</i>	310.16	130,18	0.017
<i>hw_sem</i>	1241.28	124.20	< 0,001
<i>hw_soc</i>	-221.26	94.27	< 0,001
<i>hw_pen</i>	439.96	93.55	0.019
<i>sem_agr</i>	990.98	414.28	0.017
<i>sem_hw</i>	517.66	117.62	< 0,001
<i>edu_ter</i>	862.74	105.57	< 0,001
<i>edu_sec</i>	310.65	82.84	< 0,001
<i>edu_voc</i>	117.35	81.96	0,152
<i>age35-49</i>	279.71	70.12	< 0,001
<i>age50_59</i>	254.88	74.72	0.001
<i>age60plus</i>	838.75	106.30	< 0,001
<i>income</i>	-0,78	0,02	< 0,001
Const	267.86	91.59	0.003

Dependent variable: *dincome* is an increase in net personal income in a panel of 3095 persons who changed their occupation between 2007 and 2008.

Source: Household Budget Surveys, 2007-2008 Panel of individuals, Poland, Central Statistical Office, Warsaw.

We interpret regression coefficients as changes of binary variables of the increase in net personal income of given categories in comparison to a reference category.

Mobility in all directions, e.g. to different occupations, increases income, except for quitting a job for the social security benefit which is lower than former wage. The highest increase in income is gained by those who changed the hired work for self-employment in industry or services. The second highest gain in income was observed by a move from self-employment to an activity in agriculture. In this case mobility concerns a move between similar types of activity.

A passage from pension to hired work and from an activity in agriculture to hired work as well as from self-employment in industry or services to hired work brought the relatively lower but still significant increases in earnings.

As far as education is concerned, respondents with the education level above primary education experienced a higher increase in income than those with primary education. The highest increase in income was observed by respondents with tertiary education. Persons in the age group of 60 and more achieved the biggest increase in income in comparison with the age group of 20-34 years. Persons who earned a higher income in 2007 experienced a relatively lower increase in income in 2008, so the regression coefficient is negative at the variable *income*.

## 5. Conclusions

In this paper we have analyzed how a change of occupation affects individual capability to earn income. The analysis concerns the mobility of individuals between broadly defined types of occupation such as: hired work, self-employment in industry, services or agriculture and social security. The change of occupation was examined in groups of individuals according to: age, level of education and a permanent or temporary character of work.

The Markov matrices were applied to the panel data on 30,540 individuals for 2007-2008 from the Polish Household Budget Surveys. Then the regression analysis was conducted for a group of 3095 persons who changed their occupation and their main source of maintenance between 2007 and 2008.

Our results show that in most cases a change of broadly defined occupation increases income, except for quitting a job for the social security benefit. The mobility matters mostly for those who changed hired work for self-employment in industry or services. A shift from self-employment to an activity in agriculture brought the second highest gain in personal income. Other changes of occupation, e.g. from self-employment in agriculture, industry or services to hired work lead to relatively lower but still significant increases in earnings.

Respondents with tertiary education who were mobile in different directions reported the highest increase in income and those with secondary education benefited from changing occupation as well. The inter-occupational mobility matters mostly for persons in the age group of 60 and more. Persons in the age of 35-59 also noted a sizable increase in income in comparison with the age group of 20-34 years.

The increase in income in 2008 was relatively lower for persons who earned a higher income in 2007, which is partially a statistical effect of a higher income base in 2007. However, it shows that mobility between different occupations can be beneficial for individuals at all levels of initial income.

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