

The role of headhunters in wage inequality and jobless recoveries

Alexey Gorn *

August 12, 2014

Very preliminary and incomplete

Abstract

Boom in headhunter industry happened in the same period as the sharp increase of labor income of top part of the wage distribution. Wage inequality rose more in countries where headhunters were more actively used. This paper provides a theoretical model explaining how an increased use of headhunters might generate increase in wage inequality with the strongest effect on the very top of wage distribution. It also tries to assess the role of headhunters in wage inequality.

The paper also proposes a new mechanism that generates jobless recoveries with the rise of headhunter industry.

*Bocconi University. Email: alexey.gorn@phd.unibocconi.it

1 Introduction

Wage inequality was increasing steadily from early 80s in the United States, United Kingdom and Canada, while it increased only slightly in continental Europe over the same period¹. And main driver of these changes in US, UK and Canada have been an unprecedented surge in top wage incomes. Despite the importance of wage inequality there is no conventional explanation nor of this sharp increase in wage inequality, neither of the cross-country difference of this phenomena. This paper attempts to contribute to the existing explanations by adding a separate channel for hiring high-skill workers into the standard model of labor market a la Diamond, Mortensen and Pissarides. The channel is motivated by increasing role of headhunters in the labor market, especially in the top wages segment. It is intuitive that with presence of skill complementarities, when high-skilled workers and high-productive firms have a separate channel to meet, the wages of highly skilled workers will increase with respect to the rest workers and the wage inequality will rise.

There are several explanations of increase in wage inequality, they are discussed in Atkinson, Piketty, and Saez (2011). Two main explanations are the decrease in the top marginal tax rate (Alvaredo et al, 2013, Piketty, 2003) and the skill biased technological change (Acemoglu, 2002, Lemieux, 2008). Decrease in marginal tax rates gives more incentives to top-earners to put higher effort or simply to work more, so they labor income increases. At the same time, with lower marginal tax rate the worker's bargaining power increases because she gets more net income with the same increase in wage. As Alvaredo et al (2013) show, there is a negative correlation between reduction in marginal tax rates from 1960 to 2005 and increase in top 1% income share in the same period. Another possible explanation that they provide is that reduction of top marginal income taxes reduces tax avoidance by the very rich, so increasing income inequality can be purely a statistical phenomena. However, as they also note, it is more relevant for income inequality rather than wage inequality, because the tax avoidance came more from realized capital gains. Also, this explanation doesn't explain well the dynamics of changes in inequality. The decreases of marginal taxes were made in 80s (1986 in US) and stayed almost constant afterward, while inequality was increasing gradually and still keeps changing.

Another popular explanation of the increased wage inequality is the skill-biased technological change. Because of increased returns on skill the wages of high-skilled workers rise. At the same time the low-skilled workers are substituted with automated machines or computers, so the wages of low-skilled workers fall. Indeed, Acemoglu (2002) shows that between group wage inequality rises, for example the college degree premium rises by 25% from 1979 to 1985. But this explanation have difficulties in explaining the sharp increase of very top wages and cross-country differences.

This paper attempts to contribute to the existing explanations of increased wage inequality by introducing a headhunter channel into standard random matching model of the labor market. Headhunters provide an exclusive hiring channel for high-skilled workers that only high-productive firms can afford. This provides both high-skilled workers and high-productive firms with mutually better matches, increasing the match surplus for such matches because of skill complementarities. Higher match surplus is associated with higher wages for the workers. Moreover, headhunters can provide contacts with not only unemployed workers but also already employed, so high-productive firms will be matched only with high-skilled workers. Supporting empirical evidence presented in the next section shows that the rise of wage inequality in US, UK and Canada matches in time the boom in the headhunter industry in these countries. Profits of major headhunter companies

¹See for example Atkinson, Piketty, and Saez (2011)

were increasing sharply during the period under consideration and they keep growing now. Also, there is huge difference in headhunters' fee revenues in North America and Continental Europe that suggests the fact that there is a role of headhunters in explaining wage inequality. Finally, this type of headhunters operate in the top part of wage distribution and with highly-skilled workers, that was exactly the main driver of increased wage inequality.

Uren and Virag (2011) use similar idea of random matching with skill requirements to explain the increase in between-group inequality over the same period together with the increase of within-group inequality for high-skilled workers and the decrease of within-group inequality for low-skilled workers. These empirical facts are also well documented in the literature (for example Lemieux, 2008). However, they need to impose skill-biased technological change to have these changes in wage inequality. While, in this paper appearance and increasing use of headhunters by firms is enough to have an increase in wage inequality. Also, Uren and Virag concentrate on explaining the patterns of changes in within-group inequality and between-group inequality rises mainly because of technological change and not as a result of model interactions. They leave aside the increase in top wage shares over this period when it is the main goal of this paper.

This paper shows that in a simulated model presence of headhunters in the labor market may generate an increase in wage dispersion and top labor income share of a magnitude comparable to the data. Empirical analysis of relationship between headhunters' fee revenues or number of hires and wage inequality in US and cross-country comparison are still in progress. However, some indirect evidence is presented.

The last three recoveries after crises of 1990, 2001 and 2008 are characterized to be slow or jobless. The common feature of these three recoveries is that employment (and unemployment) restored slower compared to the previous recessions. This especially stands out in the last recovery, the level of unemployment stays above pre-crisis level already for 6 years. There is no commonly agreed explanation of this phenomena with the most popular explanations being the mismatch on the labor markets and amplification mechanisms related to precautionary savings.

For a discussion about how mismatch affects unemployment see for example Sahin, Song, Topa, and Violante (2014). Because of changes in the composition of job openings and workers it may be more difficult for a firm to find a worker that suits the job and for worker to find a job. So, the aggregate job finding rate decreases and unemployment increases. However, Sahin et al. (2014) show that the occupational mismatch can explain only up to 1/3 of the increase in the unemployment in US.

Another explanation of such behavior of unemployment is connected to precautionary savings. Because of increase in the uncertainty of future incomes due to the crisis workers increase their savings to be able to smooth their future potential drops in incomes. This in turn affects the current demand on the products of the firms who decrease job creation (or increase separations) in response to drop in demand. The probability of loosing a job or the probability of finding a job in the future decrease, rising even more the motives for precautionary savings. Such mechanisms are present for example in Sterk and Ravn (2013) and Challe and Ragot (2013). Though, such models cannot explain the difference between the last three jobless/slow recoveries and the past recoveries.

This paper introduces another possible explanation of this feature of recent recoveries. The main idea behind this explanation is the presence of a separated channel on the labor market for high-skilled workers and high-productive firms. This channel can be associated to the headhunters that act as intermediaries in the labor markets, importance of headhunters will be discussed in the next section. When the second channel is present and is actively used by firms, high-skilled

workers will not be searching through the standard channel when they are employed but will use only this separated channel.

The presence of this separate channel may generate jobless/slow recoveries through the following mechanism that can be viewed as a two-sided composition effect. During a crises firms start to switch from this more costly separated channel to the standard channel. Following this, high-skilled employed workers also start to switch to the standard channel. Then the probability of finding a high-skilled worker through the standard channel increases and even more firms will switch to it. In the end most of the firms and workers who were using the separated channel before the crises will switch to the standard channel after the crises. This crowds out the unemployed workers (especially low-skilled) from the standard channel and the unemployment rises. This switch may persist for a long period of time.

Popularity of headhunters started to increase during 1980s and was rising afterward. This may explain the difference in the speed and nature of the recent recoveries in comparison to the past recoveries.

The reminder of the paper is organized as follows. Section 2 discusses the available empirical evidence about headhunters and headhunter industry. Section 3 presents the theoretical model. Section 4 discusses implications of the model on wage inequality. Section 5 provides cross-country comparison. Section 6 concludes.

2 Headhunter boom

First headhunter companies were opened already in 1950s, but first decades of their activity they were not popular or very successful. The reason for that was their way of searching for candidates, the main source of candidates for an open position were social networks. Often they suggested to the company that hired them a candidate that already had connections in the company. In 1980s headhunters started to change their way of search. Instead of checking connections of potential candidates they started to evaluate the skills of the candidates and create databases of potential candidates for different positions. Soon they started to screen candidates better than standard HR departments and their popularity started to increase. That was a start of the boom of headhunter industry. For example, the world leader headhunter company Korn/Ferry's fee revenues increased from £501461 in 1980 to £1761405 in 1985 only in UK, and then reached £13 million in 1990 in Europe (Faulconbridge, Hall, and Beaverstock, 2008). The industry still keeps growing, estimated total fees of the industry increased from \$5 billion in 2004 to \$10.2 billion in 2011 worldwide.

It is important to distinguish between two types of headhunters - retained and contingency headhunters. Retained headhunters that are under consideration in this paper have an exclusive permanent contract with a company, and when a company needs to hire a new worker the retained headhunter takes care about searching for potential candidates and evaluates them for the company. Retained headhunters mainly work with positions that are paid more than \$150,000 per year (executives and other highly skilled workers). The average fee is around 30-40% of the workers annual salary and it is paid regardless of whether the search was successful or not. Contingency headhunters in the contrary don't have a permanent contract with the company and they are paid only if the firm hires the candidate provided by them. They work with medium- and high-skilled workers with the wage range from \$15,000 to \$150,000 a year that is a wide range of positions from nurses and clerks to accountants and top managers.

It is not easy to estimate the exact share of hires made through headhunters because the information about headhunter's clients is private and firms often don't announce the opened position

anywhere except of the headhunter. However, Cappelli and Hamori (2013) state that headhunters fill 54% of positions with annual wage above \$150,000 and most of the rest positions are filled through internal promotion. So, headhunters are the primary source of hiring in the top part of wage distribution.

As for the size of the labor market share of contingency headhunters, according to the survey of medium-sized firms by Fordyce Letter (1995) 30% of firms “regularly” used headhunters. The New York Times (January 30, 2001) later estimated that nearly half of managers over age 35 speak with headhunters at least quarterly. Finally, in 2005 according to the estimates of Finlay and Coverdill (2007) “headhunters are a leading, and possibly even the primary, means of recruiting employed candidates who occupy professional and managerial positions”. So, the share of the headhunters may be up to 30-40%, and the usage of this channel may influence the whole labor market.

Headhunters work in the following way. A firm searching for a worker hire a headhunter. The headhunter searches for a suitable candidate in it’s databases or other sources. The headhunter calls the candidate (employed or unemployed) asking whether she wants to consider an offer without specifying any details (firm, wage, etc.). If the candidate agrees to consider the offer she has an interview with the headhunter. If the interview is successful the offer is disclosed and the candidate is connected with the firm where she goes through standard hiring procedure.

The fact that headhunters may contact the employed workers who are not searching actively for another job is one of the main advantages of this hiring method. This solves the adverse selection problem - good workers working in good firms will not search actively for even better job, while if a headhunter calls them they may want to consider a new offer. The study by Capelli and Hamori (2013) show that more than half of executives want to consider an offer when a headhunter calls them.

Another important feature of the headhunter industry is the cross-country difference of the fee revenues. The major part of the fees is coming from North America and UK. For example the world leader of the industry Korn/Ferry Int. received 56% of it’s fee revenues from North America while only 24% came from Europe, Middle East and Africa combined, 15% from Asia Pacific and the rest 5% from Latin America.

3 The model

Environment

The world is populated by a continuum of heterogeneous workers differing in their skill level who supply inelastically one unit of labor if they are employed. When a worker is unemployed he benefits from home production activity, unemployment subsidies, leisure and other possible sources he cannot enjoy during employment. Also there is a continuum of heterogeneous firms that differ in their productivity level. Each firm can hire one worker. To do this a firm needs to post a vacancy or to go to a headhunter company.

Assume that all workers unemployed and employed can search for a job. Each period workers decide whether to search for a job checking vacancies (search actively) and/or to be available for a headhunter company (search passively). Workers searching for a job and firms posting a vacancy are matched randomly by a standard CRS matching technology. Firms using headhunters are randomly matched with workers above a certain level of skill with possibly different matching technology. In the baseline model the wage in a match is determined period by period as a fraction of resulting productivity. Productivity of a match depends on the firm’s productivity level and

worker's skill level. Firms can choose only one channel while workers can search both actively and passively (if they are eligible).

Separation of matches depend on two factors: 1) aggregate exogenous separation shock; 2) workers quitting to another job.

Timing

Assume that time is discrete. First, existing matches produce and wages and unemployment benefits are paid. Then exogenous separation happens. Workers decide in which markets to participate, new firms decide to enter the market and choose the market to search. After that workers searching for a job and firms searching for a worker match.

Matching

There are two channels in the labor market: vacancy and headhunter channels. In channel $i = \{V, H\}$ workers and firms meet by standard matching technology: $m_i = m_i(u_i + a_i, i)$, where m_i is the number of matches, u_i and a_i are numbers of unemployed and employed workers participating in this channel, respectively, and i is the number of firms participating in the channel. So, the job finding rate for a worker using channel i is $f_i(u_i, a_i, i) = \frac{m_i(u_i + a_i, i)}{u_i + a_i}$ and the firm's worker find rate is $q_i(u_i, a_i, i) = \frac{m_i(u_i + a_i, i)}{i}$.

Wages

For simplicity, in the base model assume that wage is proportional to the match productivity: $w(e, p) = \psi \cdot y(e, p)$ with $\psi < 1$. Also assume that $y(e, p)$ is linear in p and increasing and concave in e .

Worker side

Consider first the problem of unemployed worker. Let the cost of searching in the vacancy channel be c_{wV} and cost of interacting with a headhunter be c_{wHH} . First, consider the search choice problem, the worker decides which market(s) to participate.

Let the value of the search of a high-skilled unemployed worker be:

$$S_U(e) = \max \{S_{UV}(e), S_{UH}(e), S_{UVH}(e), 0\}$$

where:

$$S_{UV}(e) \equiv f_V(\cdot) E_{p|V} [\max \{W(e, p), U(e)\} - U(e)] - c_{wV}$$

$$S_{UH}(e) \equiv f_H(\cdot) (E_{p|H} [\max \{W(e, p), U(e)\} - U(e)] - c_{wH})$$

$$S_{UVH}(e) \equiv f_H(\cdot) (E_{p|H} [\max \{W(e, p), U(e)\} - U(e)] - c_{wV}) + \\ + f_V(\cdot) (1 - f_H(\cdot)) E_{p|V} [\max \{W(e, p), U(e)\} - U(e)] - c_{wV}$$

So, the value of unemployment is:

$$U(e) = b + \beta(U(e) + S_U(e))$$

For low-skilled unemployed worker the problem is exactly the same with the only difference that she can choose to participate only in standard market, so her value of search is:

$$S_U(e) = \max\{S_{UV}(e), 0\}$$

and all other value functions are the same as for high-skilled unemployed workers.

Now consider an employed worker. She also decides whether to participate in the markets, but with different outside option.

For a high-skilled worker the search problem is:

$$S_E(e, p) = \max\{S_{EV}(ep), S_{EH}(e, p), S_{EVH}(e, p), 0\}$$

where:

$$S_{EV}(e, p) \equiv f_V(\cdot) E_{p|V}[\max\{W(e, p'), W(e, p)\} - W(e, p)] - c_{wV}$$

$$S_{EH}(e, p) \equiv f_H(\cdot) (E_{p|H}[\max\{W(e, p'), W(e, p)\} - W(e, p)] - c_{wH})$$

$$S_{EVH}(e, p) \equiv f_H(\cdot) (E_{p|H}[\max\{W(e, p'), W(e, p)\} - W(e, p)] - c_{wV}) +$$

$$+ f_V(\cdot) (1 - f_H(\cdot)) E_{p|V}[\max\{W(e, p'), W(e, p)\} - W(e, p)] - c_{wV}$$

And for a low-skilled employed worker the search problem is:

$$S_E(e, p) = \max\{S_{EV}(e, p), 0\}$$

If a worker decides to stay in a firm or doesn't receive an offer, her value is:

$$W(e, p) = w(e, p) + \beta(s(U(e) + S_U(e)) + (1 - s)(W(e, p) + S_E(e, p)))$$

Firm side

Firms also choose channels in the same manner as the workers, but they all solve the same problem (regardless of productivity level) and they may choose only one channel:

$$V(p) = \max\{V_V(p); V_H(p); 0\}$$

Where the value of posting a vacancy for a firm is:

$$V_V(p) = -c_{fV} + \beta(V(p) + q_V(\cdot) E_{e|V}[Pr(\text{no better offer})(J(p, e) - V(p))])$$

and the same for contacting a headhunter:

$$V_H(p) = -c_{fH} + \beta(V(p) + q_H(\cdot) E_{e|H}[J(p, e) - V(p)])$$

where $E_{e|i}$ is the expectation over worker's skill level conditional on the use of channel i .

If the firm hires a worker or a match stays for this period, the firm receives:

$$J(p, e) = y(e, p) - w(e, p) + \\ + \beta ((s + s_Q(\cdot)(1 - s))V(p) + (1 - s_Q(\cdot))(1 - s)J(p, e))$$

where c_{fV} is the cost of posting a vacancy, $y(\cdot)$ is the productivity of the match, and $s_Q(\cdot)$ is the quit rate of worker to different job.

Free entry condition of the firms is the following:

$$E_p[V(p)] = F$$

where F is a fixed cost of creating a firm that is payed once to enter the market. It is assumed that before entering the market, firms don't know their level of productivity.

Steady-state separating equilibrium

Distributions

First, we need to specify distributions that will be used in expectations. Let $F(p)$ be initial distribution of firm productivity level and $G(p)$ the measure of firms that open a vacancy or contact a headhunter (both CDF have support $[\underline{p}, \bar{p}]$). Also denote as \hat{p} the cutoff level of firm productivity, so the fraction of firms posting a vacancy is $\frac{G(\hat{p})}{G(\bar{p})}$.

Let $H(e)$ be the initial distribution of all workers over skill level, $L_V(e)$ be the measure of workers searching for a job through the vacancy channel, $L_H(e)$ the measure of workers searching for a job through the headhunter channel, and $U(e)$ the measure of unemployed workers over the skill level (all with support $[e_0, \bar{e}]$).

Finally, let $\Phi(e, p)$ be joint measure of active matches. And $\Lambda_i(e, p)$ be the measure of active matches in which worker is searching for a new job through channel $i \in \{V, H\}$.

Workers

As all low-skilled unemployed workers search for a job only through vacancies, their value of search will be:

$$S_U(e) = S_{UV}(e) \equiv f_V(u_V, a_V, v) \int_{\underline{p}}^{\hat{p}} (W(e, p) - U(e)) dG(p) - c_{wV}$$

And value function of high-skilled unemployed workers is:

$$S_U(e) = S_{UVH}(e) \equiv f_H(u_H, a_H, h) \left(\int_{\hat{p}}^{\bar{p}} (W(e, p) - U(e)) dG(p) - c_{wH} \right) \\ + f_V(u_V, a_V, v) (1 - f_H(u_H, a_H, h)) \int_{\underline{p}}^{\hat{p}} (W(e, p) - U(e)) dG(p) - c_{wV}$$

Low-skilled employed worker matched with a firm with productivity p searches for another job if:

$$S_{EV}(e, p) \equiv f_V(u_V, a_V, v) \int_{\underline{p}}^{\hat{p}} \max\{W(e, p') - W(e, p); 0\} dG(p') - c_{wV} \geq 0$$

We can rewrite it as:

$$S_{EV}(e, p) \equiv f_V(u_V, a_V, v) \int_p^{\hat{p}} (W(e, p') - W(e, p)) dG(p') - c_{wV}$$

This equation implicitly determines the level of firm productivity such that a worker with experience e doesn't search for a new job: $\tilde{p}_V(e)$ (for $e < \underline{e}$). And his value function of searching will be:

$$S_E(e, p) = \max\{S_{EV}(e, p); 0\}$$

High experienced employed worker matched with a firm with productivity p is available for headhunters (searches passively) if:

$$S_{EH}(e, p) \equiv f_H(u_H, a_H, h) \left(\int_{\hat{p}}^{\bar{p}} \max\{W(e, p') - W(e, p); 0\} dG(p') - c_{wH} \right) \geq 0$$

Again, this equation implicitly determines the cutoff level of productivity to be available for "head hunters", $\tilde{p}_H(e)$ (for $e \geq \underline{e}$). And the value function of searching is:

$$S_E(e, p) = \max\{S_{EH}(e, p); 0\}$$

note, that for this strategy to be optimal we need to have:

$$\max\{S_{EV}(e, p); S_{EH}(e, p); S_{EVH}(e, p); 0\} = \max\{S_{EH}(e, p); 0\}$$

for all $p \geq \hat{p}$ and $e \geq \underline{e}$. Or again we can rewrite $S_{EH}(e, p)$ as:

$$S_{EH}(e, p) \equiv f_H(u_H, a_H, h) \left(\int_p^{\bar{p}} (W(e, p') - W(e, p)) dG(p') - c_{wH} \right)$$

Finally, if the worker stays in the match this period, his value function is:

$$W(e, p) = w(e, p) + \beta(s(U(e) + S_U(e)) + (1 - s)(W(e, p) + S_E(e, p)))$$

And the value of unemployment is:

$$U(e) = b + \beta(U(e) + S_U(e))$$

Firms

As described before, firms are divided in two groups: those who post vacancies and those who use headhunters. For such strategy to be optimal we need to have:

$$\max\{V_V(p); V_H(p); V_{VH}(p)\} = V_V(p)$$

for $p < \hat{p}$ and

$$\max\{V_V(p); V_H(p); V_{VH}(p)\} = V_H(p)$$

for $p > \hat{p}$ (will be checked in existence section). So, the cutoff productivity is determined by:

$$V_V(\hat{p}) = V_H(\hat{p})$$

The value function of firms posting a vacancy in this case is:

$$V_V(p) = -c_{fV} + \beta \left(V(p) + q_V(u_V, a_V, v) \frac{u_V}{u_V + a_V} \int_{e_0}^{\underline{e}} (J(p, e) - V(p)) dL_V(e) + \right. \\ \left. + q_V(u_V, a_V, v) \frac{a_V}{u_V + a_V} \int_{e_0}^{\underline{e}} \frac{\int_{\underline{p}}^p \lambda_V(e, p') dp'}{\int_{\underline{p}}^{\bar{p}} \lambda_V(e, p') dp'} (J(p, e) - V(p)) dL_V(e) \right)$$

And the value function of firms using headhunters is:

$$V_H(p) = -c_{fH} + \beta \left(V(p) + q_H(u_H, a_H, h) \frac{u_H}{u_H + a_H} \int_{\underline{e}}^{\bar{e}} (J(p, e) - V(p)) dL_H(e) + \right. \\ \left. + q_H(u_H, a_H, h) \frac{a_H}{u_H + a_H} \int_{\underline{e}}^{\infty} \frac{\int_{\underline{p}}^p \lambda_H(e, p') dp'}{\int_{\underline{p}}^{\bar{p}} \lambda_H(e, p') dp'} (J(p, e) - V(p)) dL_H(e) \right)$$

Finally, the value of active match for a firm is:

$$J(p, e) = y(e, p) - w(e, p) + \\ + \beta ((s + s_Q(\cdot)(1 - s))V(p) + (1 - s_Q(\cdot))(1 - s)J(p, e))$$

Now we can specify also the quit rate of a worker with skill e from a firm with productivity p :

$$s_Q(e, p, w) = \begin{cases} 0 & \text{if } p \geq \max\{\tilde{p}_V(e); \tilde{p}_H(e)\} \\ f_V(u_V, a_V, v) \left(\frac{G(\hat{p}) - G(p)}{G(\hat{p}) - G(\underline{p})} \right) & \text{if } p < \tilde{p}(e) \text{ and } e < \underline{e} \\ f_H(u_H, a_H, h) \left(\frac{G(\bar{p}) - G(p)}{G(\bar{p}) - G(\hat{p})} \right) & \text{if } p < \tilde{p}(e) \text{ and } e \geq \underline{e} \end{cases}$$

where $w = (u_V, a_V, v, u_H, a_H, h)$ is a vector of labor market characteristics.

4 Inequality

To show how the introduction of headhunter channel into random matching model will affect wage inequality consider first a simple example. Suppose there are two types of workers high- and low-skilled and two types of firms high- and low-productive with mass $\frac{1}{2}$ each. High-skilled workers receive a wage of \$3 working in a high-productive firm and \$2 working in a low-productive firm. Low-skilled workers receive wage \$2 working in a high-productive firm and \$1 working in a low-productive firm. When there is just one labor market channel for matching workers and firms workers will be distributed equally between the types of the firms (see Table 1). But when there are separate channels for high- and low-skilled workers, high-skilled workers will work only in the high-productive firms and low-skilled workers in low-productive firms. Wage dispersion that is one of indicators of wage inequality will be higher in the second case.

Similar mechanism is present in the model described before. Headhunter channel allows to separate high-skilled workers reducing frictions for them and providing them with exclusive opportunity to work in high-productive firms. Presence of this channel changes the distribution of the workers over the wages. Without headhunter channel the distribution is close to log-normal even for simple parametrization (with uniform distributions of firm types and worker skills) that is depicted in Figure 1. When the headhunter channel is present in the model, the distribution has one more spike in it's top part (Figure 2), for a calibrated model it will have no spike but a fat tail of the distribution instead similar to what is observed in the data. So, the headhunter channel generates the fat tail of the wage distribution in this model. The reason for this is the following, without headhunter channel the probability of matching a high-skilled worker with a high-productive firm is the same as matching a high-skilled worker with low-productive firm, so there will be big shares of high-skilled workers working in low-productive firms and low-skilled workers in high-productive firms. Because of skill complementarities wages of low-skilled workers a lower than wages of high-skilled workers in the same type of firm. And because only some high-productive firms will be matched with high-skilled workers there will be a small mass of workers getting very high wages. When there is a possibility to hire only high-skilled workers through the headhunter channel, high-productive firms will be matched only with high-skilled workers and all of them will receive relatively high wages, that corresponds to the fat tail of the distribution.

Another important feature of the data that the model predicts apart from wage dispersion and a fat tail of wage distribution is the increase of average wage relative to median wage. It comes naturally with the fat tail of the distribution. The change in the median and average wage in US and the ratio of the two is depicted in Figure 3. The ratio of median to average wage decreased from around 72% to 65% from 1990 to 2012. And the corresponding variables from the model simulations are presented in Table 2. Even parametrized model predicts similar magnitude of the change in the ratio of median to average wage, it changes from 74% in the model without the headhunter channel to 68% in the model with the headhunter channel. However, the parametrized model cannot match the magnitude of increase in average wage and the increase in median wage. It fails here because in the steady states that are compared in the model have the same parametrization, while in the data the level of technology might increase over the 20 years span and inflation could play a role.

As it was stated before, increase in wage inequality was mainly driven by the sharp increase of top wages. Figure 4 shows the top 10% income share in the US from 1917 to 2007 (data from Atkinson et al., 2011). The share increased from 35% in 1980s to almost 50% in 2007. But if we separate this share further, we can see from Figure 5 that this increase was driven mainly by the increasing share of the top 1%, rising from 10% to almost 25%. Moreover, decomposing the

income by the sources (Figure 6) shows that one of the main sources of this sharp increase was because of salaries, as the share of salaries even increased during the period from 1980s to 2012. Similar income shares derived from the parametrized solution of the model are presented in Table 3. As one can see from the table, even the simple parametrization delivers close to the data top 1% income shares both for the case of 1980s (before headhunter channel was used) and for 2007 (when headhunter channel is used). This shows that the sharp increase in top 1% wages may be generated by the presence of headhunters. However, the parametrized version of the model doesn't implement properly the movements in top 1-5% and top 5-10% shares. In the data this shares increased slightly while in the model they even decrease.

5 Cross-country comparison

Headhunters are used in different extent in different countries. It may be the result of different labor market legislation, different hiring practices, traditions, labor force skill compositions etc. But there is high correlation between wage inequality and headhunters activities, especially this is emphasized in the correlation of top labor income shares. Headhunters receive the major part of their fee revenues from the North America and mainly US (for example Korn/Ferry fee revenues by region are presented in Table 4). And the highest top labor income shares are documented to be exactly in US.

To assess properly the role of headhunters in wage inequality the dataset of headhunters' activities by region (country where possible) in the period from 1980s to present is being constructed. Indirect evidence shows that there might be very high correlation between headhunters fee revenues or number of hires by headhunters and top labor income shares. So, the presence of headhunters who provide to high-productive firms an opportunity to hire only high-skilled workers increases wage inequality.

6 Jobless/slow recoveries

The tests of ability of this model to generate jobless recoveries are still in progress. But it is presumed that it will be able to explain a significant share of the increase in the unemployment during the past three recoveries and the movements of the Beveridge curve. As it was discussed before, in response to a negative aggregate shock firms will start to switch from the headhunter channel to the vacancy channel. Then the two-sided composition effect will be at work. Workers start to switch to the vacancy channel that will stimulate more firms also to switch to the vacancy channel. In the result the unemployed workers will be crowded out from the vacancy channel, the level of unemployment will rise and the Beveridge curve will shift to the left.

As a preliminary result different Beveridge curves are depicted in Figure 8. The blue line is the Beveridge curve when there is no on-the-job search, the green line is the Beveridge curve when only low-skilled workers are searching on-the-job through the vacancy channel, and the red line is the Beveridge curve for the case when both high- and low-skilled workers are searching on-the-job. So, the model is able to generate the movements in the Beveridge curve similar to the data.

Conclusion

This paper introduces a headhunter channel to the standard model of random matching. The fact that headhunters have better information about worker's skill level and that they can approach workers who is not searching for a (new) job at this moment allows for better screening of workers and reduces labor market frictions in the top part of wage distribution. Thus, presence of headhunters generate a fat tale of wage distribution with higher labor income share of top 1% of workers.

Further, the paper is trying to contribute to explaining the sharp increase in wage inequality in US and other developed countries building a time series of headhunters' fee revenues. Then, using cross-country differences in headhunters' fee revenues it is trying to explain different degrees of wage inequality in US, UK and Canada, and Continental Europe.

The paper also proposes a mechanism that relates the rise of headhunter industry to jobless recoveries. In the model with headhunters after a crisis two-sided composition effect induces employed workers to increase active on-the-job search. Higher number of employed workers in vacancy channel crowd out unemployed workers during a crisis.

References

1. Acemoglu, Daron, 2002. "Technical Change, Inequality, and the Labor Market." *Journal of Economic Literature* 40: 7-72.
2. Alvaredo, Facundo, Atkinson, Anthony B., Thomas Piketty, & Emmanuel Saez, 2013. "The Top 1 Percent in International and Historical Perspective." *The Journal of Economic Perspectives* 27.3: 3-20.
3. Atkinson, Anthony B., Thomas Piketty, & Emmanuel Saez, 2011. "Top Incomes in the Long Run of History." *Journal of Economic Literature* 49.1: 3-71.
4. Bessy, Christian & Guillemette, De Larquier, 2003. "Hiring and market intermediaries," Post-Print halshs-00678505, HAL.
5. Burdett, Kenneth, 1978, "A Theory of Employee Job Search and Quit Rates," *American Economic Review*, 68, 212-220.
6. Burdett, Kenneth & Judd, Kenneth L, 1983. "Equilibrium Price Dispersion," *Econometrica*, *Econometric Society*, vol. 51(4), pages 955-69, July.
7. Burdett, Kenneth & Mortensen, Dale T, 1998. "Wage Differentials, Employer Size, and Unemployment," *International Economic Review*, Department of Economics, University of Pennsylvania and Osaka University Institute of Social and Economic Research Association, vol. 39(2), pages 257-73, May.
8. Cappelli, Peter, and Monika Hamori, 2013. "Who Says Yes When the Headhunter Calls? Understanding Executive Job Search Behavior". No. w19295. National Bureau of Economic Research.
9. Challe, Edouard, and Xavier Ragot, 2013. "Precautionary saving over the business cycle."
10. Faulconbridge, James R., Sarah Hall, and Jonathan V. Beaverstock, 2008. "New insights into the internationalization of producer services: organizational strategies and spatial economies for global headhunting firms." *Environment and Planning A* 40.1: 210-234.
11. Finlay, William, and James E. Coverdill, 2007. *Headhunters: Matchmaking in the labor market*. Cornell University Press.
12. Lemieux, Thomas 2008. "The changing nature of wage inequality." *Journal of Population Economics* 21.1: 21-48.
13. Mortensen, Dale T., 1994. "The cyclical behavior of job and worker flows," *Journal of Economic Dynamics and Control*, Elsevier, vol. 18(6), pages 1121-1142, November.
14. Nagypal, Eva, 2005. "Amplification of Labor Market Fluctuations: Why Vacancies Don't Like to Hire the Unemployed?," 2005 Meeting Papers 206, Society for Economic Dynamics.
15. Piketty, Thomas, 2003. "Income inequality in France, 1901–1998." *Journal of political economy* 111.5: 1004-1042.

16. Pissarides, Christopher A, 1994. "Search Unemployment with On-the-Job Search," *Review of Economic Studies*, Wiley Blackwell, vol. 61(3), pages 457-75, July.
17. Postel-Vinay, Fabien & Jean-Marc, Robin, 2002. "Equilibrium Wage Dispersion with Worker and Employer Heterogeneity," *Econometrica*, Econometric Society, vol. 70(6), pages 2295-2350, November.
18. Postel-Vinay, Fabien & Jean-Marc, Robin, 2002. "The Distribution of Earnings in an Equilibrium Search Model with State-Dependent Offers and Counteroffers," *International Economic Review*, Department of Economics, University of Pennsylvania and Osaka University Institute of Social and Economic Research Association, vol. 43(4), pages 989-1016, November.
19. Pries, Michael, 2008. "Worker Heterogeneity and Labor Market Volatility in Matching Models," *Review of Economic Dynamics*, Elsevier for the Society for Economic Dynamics, vol. 11(3), pages 664-678, July.
20. Sahin, Aysegul, Joseph Song, Giorgio Topa and Giovanni L. Violante, 2014, "Mismatch Unemployment", *American Economic Review*, forthcoming.
21. Sterk, Vincent, and Morten Ravn, 2013. "Job Uncertainty and Deep Recessions." 2013 Meeting Papers. No. 921. Society for Economic Dynamics.
22. Uren, Lawrence, and Gabor Virag, 2011. "Skill Requirements, Search Frictions, and Wage Inequality." *International Economic Review* 52.2: 379-406.

	HH	HL	LL	LH	Av. wage	Dispersion
Wage	3	2	1	2		
One channel	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	2	$\frac{1}{2}$
Two channels	$\frac{1}{2}$	0	$\frac{1}{2}$	0	2	1

Table 1: Wage dispersion with and without headhunter channel, simple example

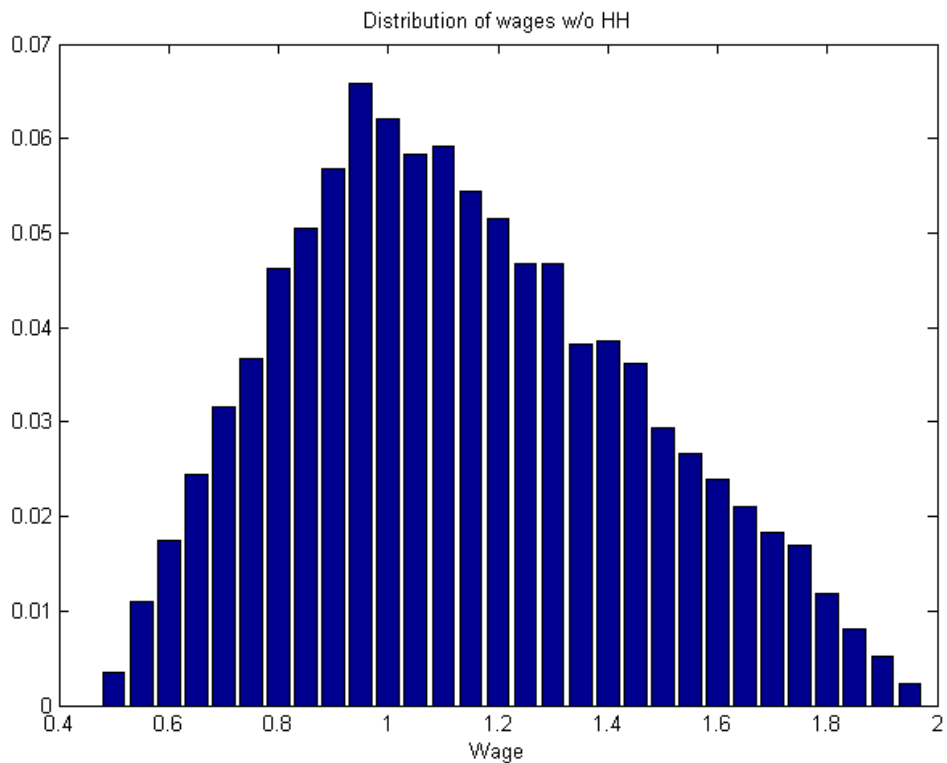


Figure 1: Distribution of wages without headhunter channel

	Average	Median	Ratio
Without HH	7.72	5.74	74.25%
With HH	8.15	5.59	68.5%

Table 2: Average and median wage with and without headhunter channel

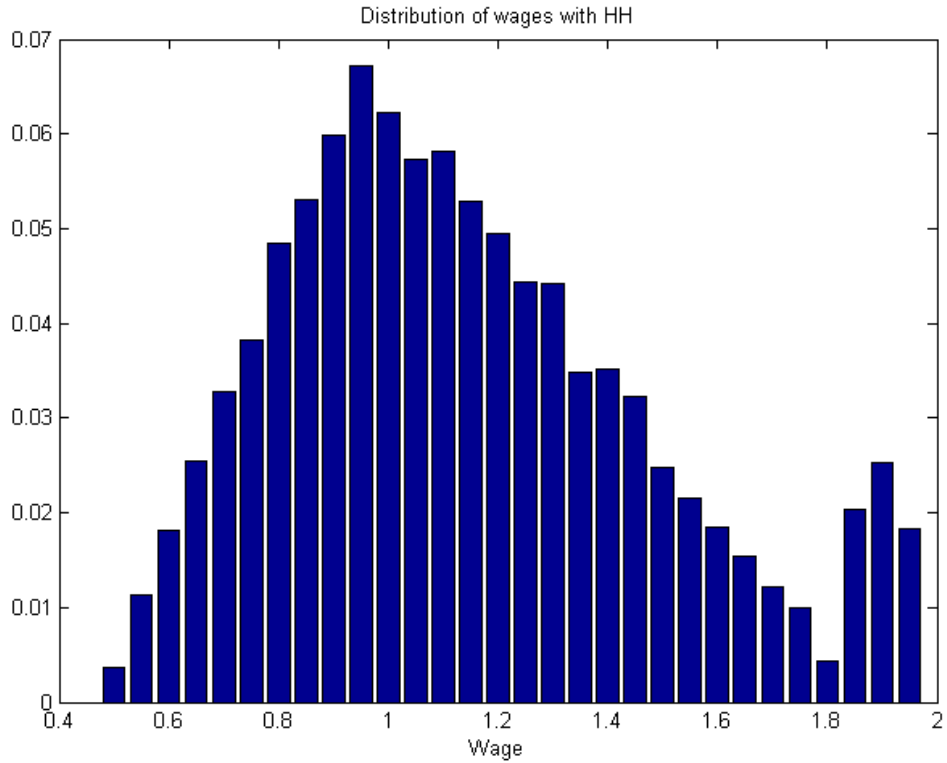


Figure 2: Distribution of wages with headhunter channel

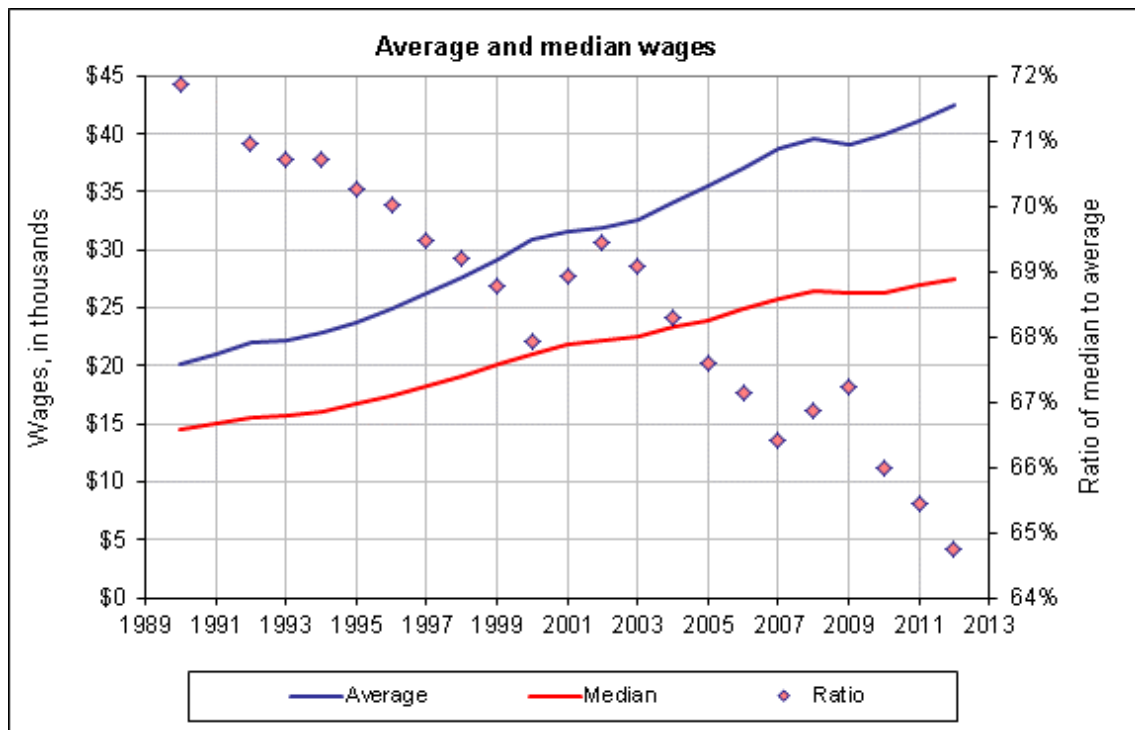


Figure 3: Distribution of wages with headhunter channel

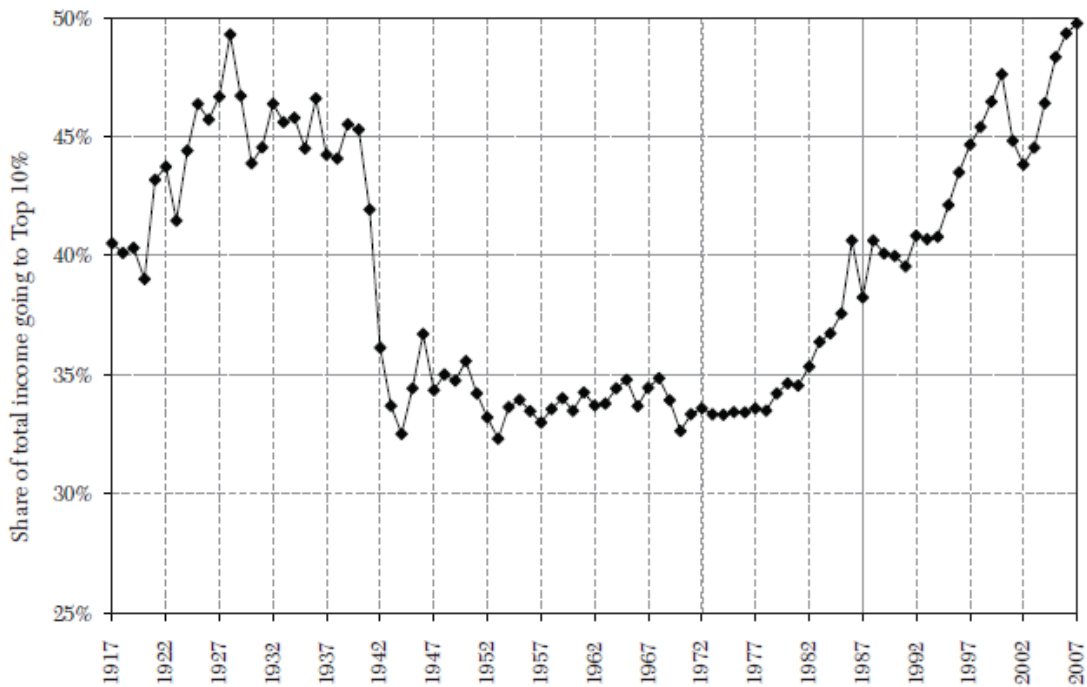


Figure 4: Top 10% income share

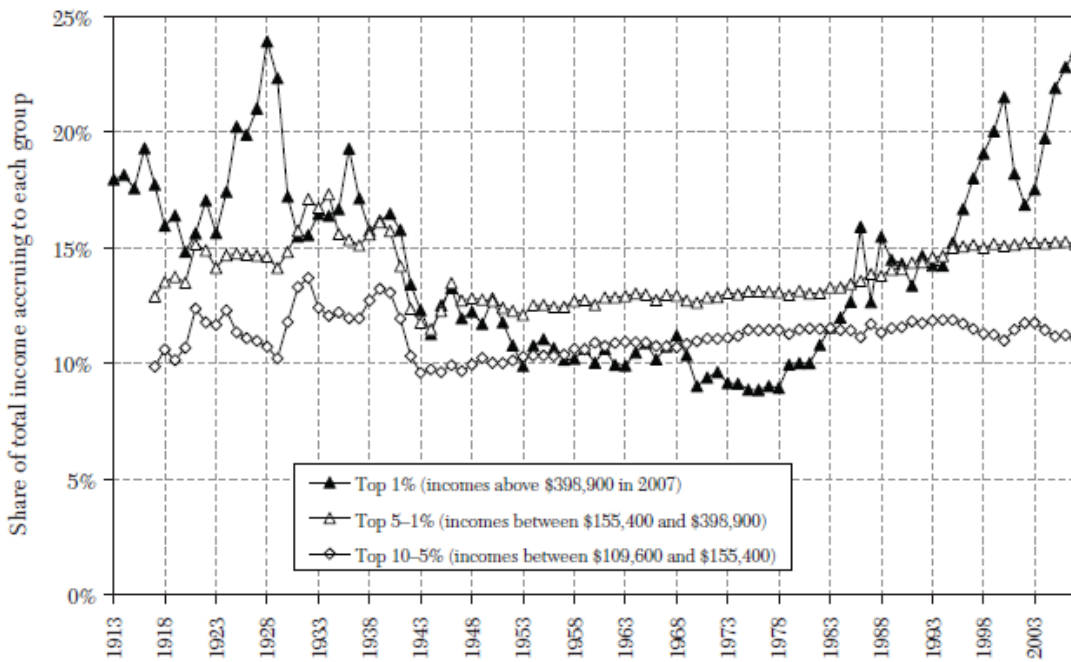


Figure 5: Three groups decomposition

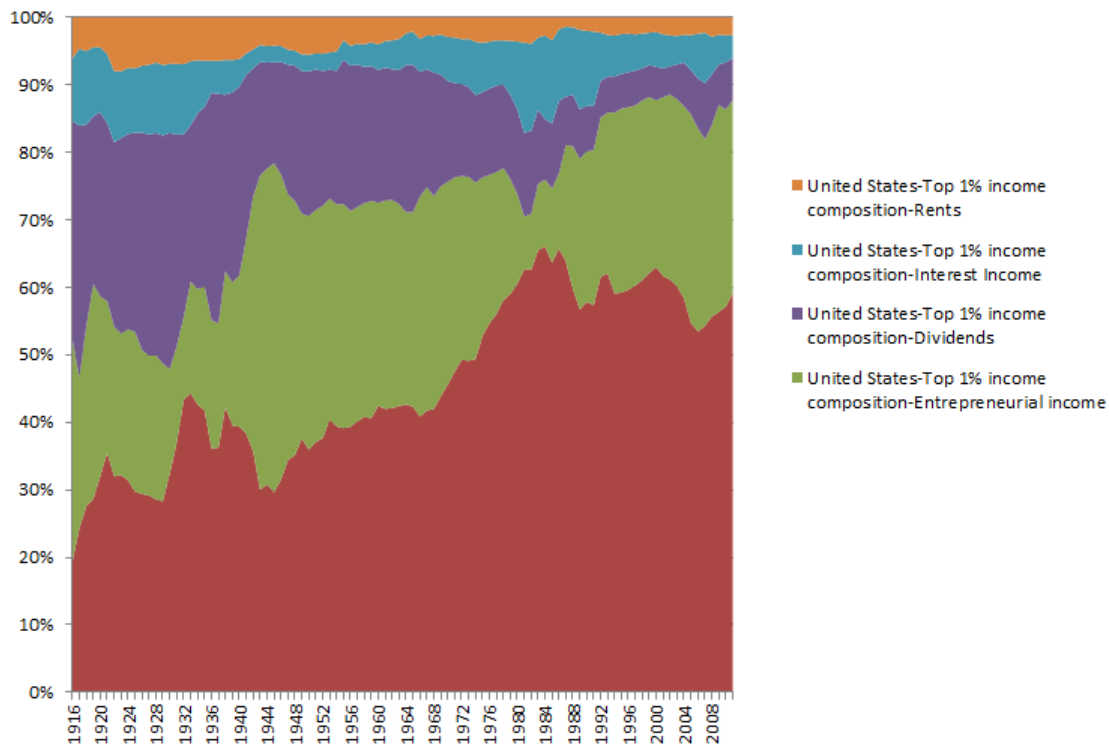


Figure 6: Decomposition of top 1% incomes

	Top 1%	Top 5%	Top 10%	5 - 1 %	10 - 5 %
Without HH	4.73%	19.27%	30.7%	14.97%	11.43%
With HH	13.4%	24.7%	35.44%	11.3%	10.74%

Table 3: Top labor income shares in the model

North America	EMEA	Asia Pacific	Latin America
56%	24%	15%	5%

Table 4: Korn/Ferry fee revenues by region

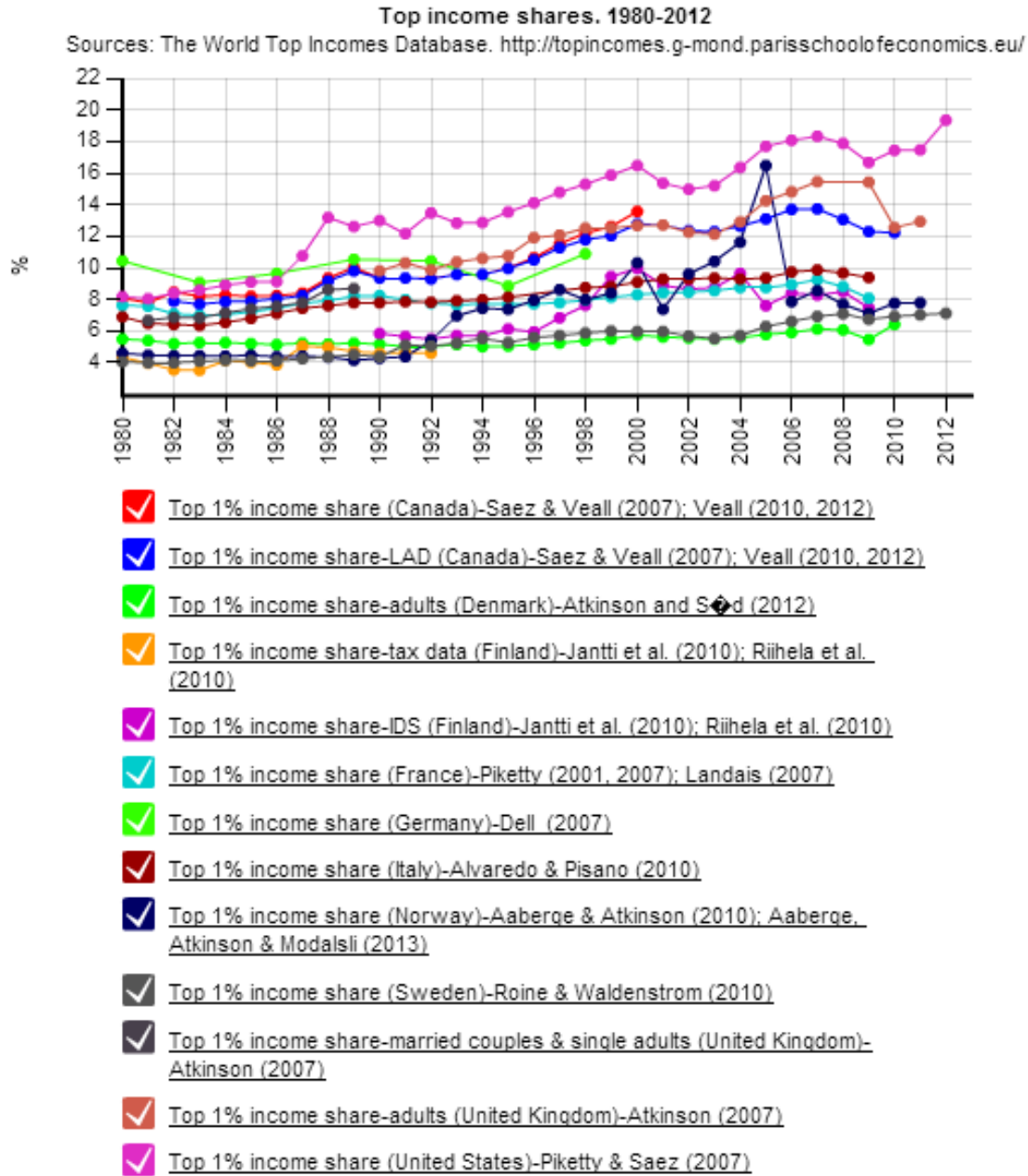


Figure 7: Top 1% income shares in different countries

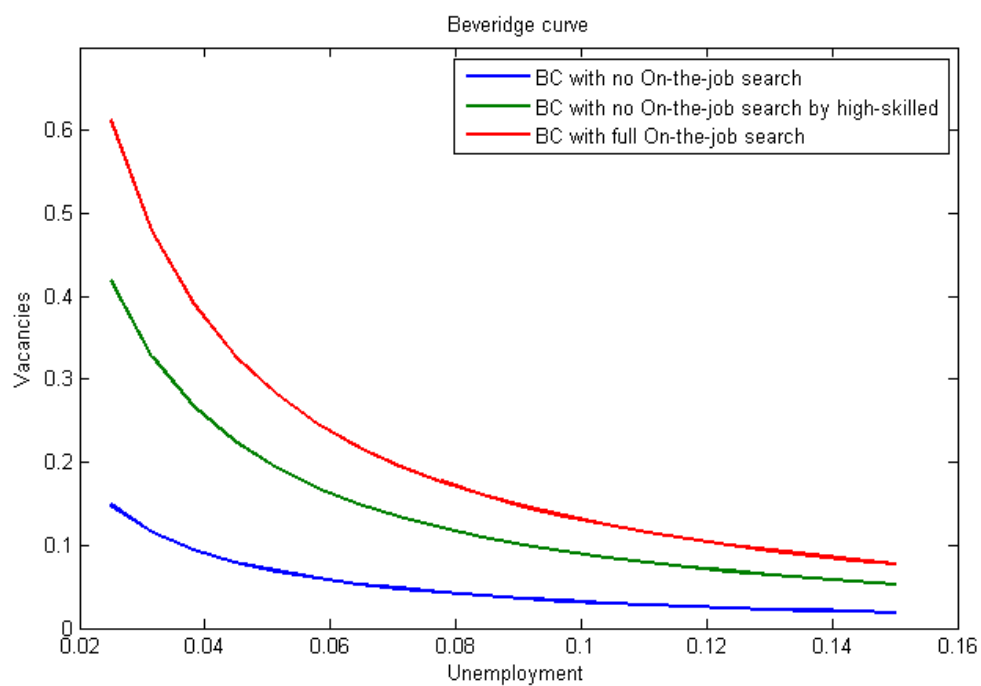


Figure 8: Beveridge curve with and without on-the-job search through the vacancy channel