Sclerosis and Large Volatilities: Two Sides of the Same Coin

Hermann Gartner
IAB

Christian Merkl
University of Erlangen-Nuremberg

Thomas Rothe
Institute for Employment Research (IAB)

(July 2012)
LASER Discussion Papers - Paper No. 64
(edited by A. Abele-Brehm, R.T. Riphahn, K. Moser and C. Schnabel)

Correspondence to:
Christian Merkl, Lange Gasse 20, 90403 Nuernberg, Germany, Email: christian.merkl@wiso.uni-erlangen.de.
Abstract

The labor market in Germany is more sclerotic and volatile than in the US. We show theoretically that sclerosis and large volatilities are two sides of the same coin. Both may be driven by large hiring costs and low quit rates.

Author note

We thank Steffen Ahrens, Timo Baas, Alessio Brown, Michael Burda, Shigeru Fujita, Aspen Gorry, Christian Haefke, Uwe Jensen, Leo Kaas, Paul Kramer, Wolfgang Lechthaler, Thijs van Rens, Jürgen Wiemers, participants of seminars at the IAB and IfW, of the ZEW conference “Recent Developments in Macroeconomics” in Mannheim, the Annual Meeting of the European Economic Association 2010 in Glasgow and the CEPR/CREI workshop on “Changes in Labor Market Dynamics” in Barcelona and anonymous referees for valuable comments and discussions.
1 Introduction

In the United States, the standard deviation of the cyclical component of labor market variables is much larger than the standard deviation of labor productivity (Shimer, 2005) or output. However, evidence on this issue in European countries is lacking. We construct a labor market time series for Europe’s largest economy, Germany, based on register data from the Federal Employment Agency. The standard deviations of unemployment, vacancies, the job-finding rate and the separation rate are larger in Germany than in the United States, both in absolute terms and relative to productivity.¹

We show in a labor-selection model that small labor market flow rates (“sclerosis”) and large labor market volatilities can be driven by large hiring costs and low quit rates. We provide evidence for the latter in a cross-country dataset.

2 The Labor Market in Germany and the United States

Labor market flows in Germany are much lower than in the United States. During our sample period (1980-2004)², the average separation rate is 2.3 percent per quarter in Germany³ and 3.6 percent per month in the United States. The job-finding rate is 28 percent per quarter in Germany and 42 percent per month in the United States. This is why European labor markets have been called “eurosclerotic” by various authors (Blanchard and Summers, 1986).

Table 1 shows that the standard deviation of unemployment in Germany is 18 times larger than the standard deviation of productivity (calculated as output per worker). The standard deviation of vacancies is 27 times larger and the standard deviation of the labor market tightness (the vacancy to unemployment ratio) is nearly 50 times larger than the standard deviation of labor productivity. The relative standard deviations of

¹In line with the literature, our volatility measures are based on the log-deviations of a time series from its HP-trend.
²For a precise description of our data, see Appendix.
³See Burda and Wyplosz (1994) for an early empirical work on the low European labor market flows.
Table 1: Summary Statistics and Correlation Matrix for West-Germany 1980-2004

<table>
<thead>
<tr>
<th></th>
<th>u</th>
<th>v</th>
<th>v/u</th>
<th>η</th>
<th>φ</th>
<th>a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard deviation</td>
<td>0.234</td>
<td>0.349</td>
<td>0.649</td>
<td>0.159</td>
<td>0.153</td>
<td>0.013</td>
</tr>
<tr>
<td>Relative to prod.</td>
<td>17.878</td>
<td>26.618</td>
<td>49.565</td>
<td>12.122</td>
<td>11.664</td>
<td>1.000</td>
</tr>
<tr>
<td>Autocorrelation</td>
<td>0.927</td>
<td>0.963</td>
<td>0.972</td>
<td>0.819</td>
<td>0.890</td>
<td>0.770</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>u</th>
<th>v</th>
<th>v/u</th>
<th>η</th>
<th>φ</th>
<th>a</th>
</tr>
</thead>
<tbody>
<tr>
<td>correlation</td>
<td>1</td>
<td>-0.833</td>
<td>-0.831</td>
<td>-0.846</td>
<td>0.744</td>
<td>-0.042</td>
</tr>
<tr>
<td></td>
<td>v</td>
<td>1</td>
<td>0.984</td>
<td>0.853</td>
<td>-0.814</td>
<td>0.163</td>
</tr>
<tr>
<td></td>
<td>v/u</td>
<td>1</td>
<td>0.861</td>
<td>-0.813</td>
<td>0.188</td>
<td></td>
</tr>
<tr>
<td></td>
<td>η</td>
<td>1</td>
<td>-0.753</td>
<td>0.216</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ϕ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: Quarterly data, seasonally adjusted using censusX12, log deviation from HP-trend with \( \lambda = 10^5 \), \( \log(X/X_{hp}) \). 1980 to 2004; unemployment, \( u \), according to ILO; vacancies, \( v \), was provided by the Employment Agency. The job-finding rate, \( \eta \), is computed as exits from unemployment divided by unemployment. The separation rate, \( \phi \), is entries into unemployment divided by employment. Labor productivity per worker, \( a \), does not include farming or public and social services and is provided by the Statistical Office.

the job-finding and the separation rate are both approximately 12.

We constructed the job-finding and separation rate from the IAB-Employment Sample (IABS). The IABS is a 2 percent sample of all employees subject to social security and unemployment benefit recipients. To ensure comparability with Shimer (2005), we calculated the job-finding rate as exits from unemployment divided by the unemployed population. The separation rate is defined as new entries into unemployment divided by employment.

Interestingly, the volatility of the labor market variables in the United States (Table 2) is lower than in Germany, both in absolute terms and relative to productivity. The unemployment time series are based on surveys (ILO definition) and thus comparable. The other series are not completely comparable, but the results are very robust. When we correct the German vacancy time series for cyclical reporting biases (since not all vacancies are reported to the Federal Employment Agency), the standard deviation of vacancies changes only marginally. When we alter the definitions of the German labor market variables (e.g., registered unemployment) or when we use different decompositions of the labor market flows, the labor market in Germany remains more volatile.
Table 2: Summary Statistics and Correlation Matrix for US 1980-2004

<table>
<thead>
<tr>
<th></th>
<th>u</th>
<th>v</th>
<th>v/u</th>
<th>η</th>
<th>φ</th>
<th>a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard deviation</td>
<td>0.155</td>
<td>0.205</td>
<td>0.356</td>
<td>0.112</td>
<td>0.052</td>
<td>0.016</td>
</tr>
<tr>
<td>Relative to prod.</td>
<td>9.479</td>
<td>12.595</td>
<td>21.859</td>
<td>6.883</td>
<td>3.184</td>
<td>1.000</td>
</tr>
<tr>
<td>Autocorrelation</td>
<td>0.958</td>
<td>0.953</td>
<td>0.958</td>
<td>0.932</td>
<td>0.639</td>
<td>0.875</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>u</th>
<th>v</th>
<th>v/u</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment</td>
<td>1</td>
<td>-0.895</td>
<td>-0.960</td>
</tr>
<tr>
<td>Vacancies</td>
<td>1</td>
<td>0.983</td>
<td>0.907</td>
</tr>
<tr>
<td>v/u</td>
<td>1</td>
<td>0.951</td>
<td>-0.410</td>
</tr>
<tr>
<td>Job-Finding Rate</td>
<td>1</td>
<td>-0.233</td>
<td>0.043</td>
</tr>
<tr>
<td>Separation Rate</td>
<td>1</td>
<td>-0.539</td>
<td></td>
</tr>
<tr>
<td>Labor Productivity</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: Quarterly average of monthly data, see Shimer (2005) and http://sites.google.com/site/robertshimer/research/flows for details.

than in the United States.\(^4\)

This section has identified two distinctive features of the German labor market, namely, low labor market flows and large labor market volatilities. In the next section, we argue that these two features may be two sides of the same coin.

3 Theoretical Explanation

We use the steady state version of a labor-selection model\(^5\) to analyze the potential connection between sclerosis and large volatilities (for a dynamic version, see the earlier version of this paper Gartner et al. (2009)). In our model, each unemployed worker contacts one firm per period. Applicants and incumbent workers both draw a realization from an idiosyncratic productivity distribution. If the productivity realization is sufficiently high, the applicant (incumbent) will be selected, i.e. hired (not fired). Applicants and incumbents are distinct in two ways: first, the firm must pay linear hiring

\(^4\)See the earlier version of this paper, Gartner et al. (2009). See also Jung and Kuhn (2010) and Nordmeier (2012).

\(^5\)We use a modified version of the model in Snower and Merkl (2006). See Brown et al. (2010) and Lechthaler et al. (2010) for dynamic selection models, which are shown not to suffer from the Shimer amplification puzzle. The version we use is similar to Pissarides (2000, chapter 6), except that we assume a degenerate matching function (all unemployed individuals contact a firm), endogenous separations and linear hiring costs. As in Khan and Thomas (2007), our model highlights the connection between the distribution of idiosyncratic productivity and the macroeconomic variables.
costs for entrants. Second, some incumbent workers will exogenously quit the job. All not hired and separated workers apply for a new job in the next period.

The sequence of decisions is as follows: first, the level of aggregate productivity is revealed. Second, an idiosyncratic productivity shock is revealed. Finally, workers and firms determine wages and firms decide whether to hire or fire. We show these steps in inverse order.

3.1 The Model

Wages: We assume that entrants and incumbents earn a constant share $\alpha$ of the aggregate productivity, $a$, and the idiosyncratic productivity, $-\varepsilon$ (defined with a negative sign): $w(\varepsilon) = \alpha (a - \varepsilon)$. Our wage assumptions are consistent with the empirical evidence by Haefke et al. (2008) that entrants’ wages are roughly as volatile as aggregate productivity.6

Selection/firing: Based on the idiosyncratic shock realization, firms decide whether to hire or fire a particular worker. The perfectly observable random worker-firm specific productivity shock, $-\varepsilon$, is iid across workers and time, with a cumulative distribution function, $\Gamma$. A firm will hire a worker whenever the expected profits of a worker are larger than zero, i.e., $\frac{a}{1 - \alpha (1 - \phi)} - \frac{h}{1 - \alpha} - \varepsilon > 0$ (wages are substituted), where $h$ denotes linear hiring costs, $\delta$ is a discount factor and $\phi$ is the overall separation rate specified below. Thus, the job-finding rate is7

\[ \eta = \Gamma \left( \frac{\alpha}{1 - \delta (1 - \phi)} - \frac{h}{1 - \alpha} \right). \quad (1) \]

A higher worker’s present value of profits (net of the idiosyncratic productivity) is associated with a higher job-finding rate. That is, workers with high idiosyncratic

---

6This mechanism is chosen to generate analytical results. Making incumbents’ wages less volatile would not alter our qualitative results. It can be shown numerically that our results also hold under a standard Nash bargaining solution.

7We assume that incumbent workers’ idiosyncratic productivities are normalized such that the expected value, conditional on not being fired, is zero. For analytical convenience, we assume that the first derivative of these conditional expectations equals zero. We can show that the omitted effects are of second order.
productivity, i.e., small $\varepsilon$, will be hired.

The overall separation rate consists of an exogenous quit rate, $\phi^x$, and an endogenous firing rate, $\phi^n$:

$$\phi = \phi^x + (1 - \phi^x) \phi^n.$$  \hspace{1cm} (2)

The firm fires a worker whenever there is no surplus:

$$\phi^n = 1 - \Gamma \left( \frac{a}{1 - \delta (1 - \phi)} \right).$$  \hspace{1cm} (3)

The employment rate $n$ is

$$n = \frac{\eta}{\eta + \phi}.$$  \hspace{1cm} (4)

The labor market equilibrium is the solution of equations (1), (2), (3), and (4).

### 3.2 Inspecting the Underlying Mechanism

Our model has two implications. First, larger hiring costs depress the job-finding rate ($\partial \eta / \partial h < 0$) and thereby increase the elasticity of the job-finding rate with respect to productivity ($\partial^2 \ln \eta / \partial \ln a \partial h > 0$ if $\Gamma''$ is sufficiently small or if $\Gamma$ has a uniform distribution). Hiring regulations are stricter in Germany than in the United States, which may be driving the lower job-finding rate and its greater volatility. Second, a lower quit rate reduces firings ($\partial \ln \phi^n / \partial \ln \phi^x > 0$) and increases the fluctuations of the firing rate ($\partial^2 \ln \phi^n / [\partial \ln a \partial \phi^x] > 0$ if $\Gamma''$ is sufficiently small or if $\Gamma$ is a uniform distribution). In terms of our model, a lower quit rate indicates that the expected job duration is longer. This will increase the average present value of profits and provide an incentive to fire less frequently on average. In addition, when the quit rate is lower an aggregate productivity

---

8Proofs can be found in Appendix.

9Because quits do not react to aggregate changes, the same is true for overall separations.
change has a stronger effect on a firm’s present value of profits for a given worker-firm pair, and thus the elasticity of the firing rate is larger. The quit rate is roughly three times larger in the United States than in Germany (Erlinghagen, 2005, and Hall, 2006), which explains the lower German firing rate and its larger volatility. While the quit rate is exogenous for firms, it may be driven by labor market institutions (e.g., if institutions reduce worker mobility), which we leave for future research.

Overall, our model establishes two potential connections between sclerosis and high volatilities: large hiring costs and low quit rates.

4 Model Implications and Cross-Country Data

The effect of hiring costs on the volatility of the job-finding rate is difficult to test in a cross-country dataset because a major share of hiring costs are training costs, for which no cross-country data exists.

In the United States and in Germany, quit rates exceed the involuntary separation
rates, and quits compose a similar share of separations in both countries (see references above). Under the assumption that this is also true in the other OECD countries (supported by the model hypothesis $\frac{\partial \ln \phi^n}{\partial \ln \phi^s} > 0$), the connection between quits and higher separation rate volatilities can be verified using cross-country data.

We use the cross-country dataset by Elsby et al. (2009). Figure 1 shows the level of the separation rate and its volatility. We find a correlation of $-0.48$ between these two variables (significance level: 6%). When we exclude the outlier, Sweden, the correlation increases to $-0.82$ (significance level: 1%). Although the data must be treated with care due to the limitations, we see this correlation as further evidence supporting the connection between sclerosis and high volatilities.

5 Conclusion

The volatility of labor market variables in Germany is higher than in the United States. Our model shows that sclerosis and high volatilities are two sides of the same coin. In addition, we provide evidence using a cross-country dataset. It is an interesting topic for future research to shed further light on the driving forces for quits, such as cultural aspects.

References


10Elsby et al. (2009) have constructed job-finding rates and separation rates. Data are only available on a yearly basis and contain some missing data points. We replace missing values with the average of the preceding and following year.


Appendix 1: Data

Unemployment according to the ILO definition exists for Western Germany up to 1991. From 1992 on, we weighted the ILO-unemployment for eastern and western Germany with the share of registered unemployment in western Germany. We choose the ILO definition, because it is survey based (i.e., workers are asked whether they have been searching for a job during the last four weeks) and therefore comparable to the U.S. definition. By contrast, workers are defined to be registered unemployed whenever they obtain unemployment benefits (which is not comparable to the U.S. definition).

Vacancies are based on the administrative data of the German Federal Employment Agency. While there is an advertising index for the United States, there is an official monthly time series for vacancies in western Germany after 1950. The German Federal Employment Agency provides information on vacancies reported by firms. Not all vacancies are reported to the Employment Agency by the firm. We corrected for this bias in the working paper version (Gartner et al., 2009) and only found minor quantitative differences. Shimer (2005) argues that the job advertising index in the United States reflects the underlying dynamics of the actual vacancies fairly well. Therefore, we consider it as legitimate to compare the German and the U.S. measures.

Job-finding and separation rates are calculated with administrative IABS data. For every person in the dataset, we determined the main employment status (employed, unemployed, or out of labor force) in January, April, July, and October. Every change in employment status between these dates was considered as an exit from one status and an entry into another status. As the labor market flows are small in Germany, a further disaggregation to the monthly level would not change our results much.

The primary objective of the empirical analysis was to compute worker flows as comparable as possible to Shimer’s (2005) paper. Thus, in line with Shimer, we used all entries into unemployment divided by the stock of employment as separation rate and all exits from unemployment divided by ILO-unemployment as job-finding rate. A different decomposition, which defines employment to unemployment transitions as separations and unemployment to employment transitions as job-findings, does not affect our main results (see Gartner et al., 2009 or Jung and Kuhn, 2010).

---

11 10th day of the month.
Appendix 2: Proofs

Proof that $\frac{\partial \phi}{\partial a} > 0$. And proof that $\frac{\partial^2 \ln \phi}{\partial \ln a \partial \phi} > 0$ for $\Gamma'' \geq 0$ or small $|\Gamma''|$. The firing rate is

$$\phi^n = 1 - \Gamma (e^f),$$

(5)

where $e^f$ is the hiring cutoff point, the idiosyncratic productivity at which the firm is indifferent between firing and not firing. It can be determined by setting the expected current and future profits equal to zero.

$$0 = a - w (e^f) - e^f + \delta (1 - \phi) (a - c) + \delta^2 (1 - \phi)^2 (a - c) + ...,$$

(6)

where $c = E(w(\varepsilon) + \varepsilon|\varepsilon < e^f)$ with $E$ as the expectations operator. After substituting the wage equation and normalizing the distribution of $\varepsilon$ such that $c = \alpha a$ (this means that the expected idiosyncratic productivity conditional on not being fired is zero, $\int_{-\infty}^{e^f} f(e) de = 0$, where $f(e)$ is the probability density function), we obtain:

$$0 = a - \alpha (a - e^f) - e^f + \delta (1 - \phi) (a - \alpha a) + \delta^2 (1 - \phi)^2 (a - \alpha a) + ...$$

Thus, the optimal firing threshold is

$$e^f = \frac{a}{1 - \delta (1 - \phi)}.$$

(7)

The firing rate (after substituting $\phi$) is

$$\phi^n = 1 - \Gamma \left( \frac{a}{1 - \delta (1 - \phi^n - (1 - \phi^n) \phi^n)} \right).$$

(8)

Using the implicit functions theorem, the reaction of the endogenous separation rate with respect to productivity changes is

$$\frac{\partial \phi^n}{\partial a} = \frac{-\Gamma' z}{z^2 - \delta a \Gamma' (1 - \phi^n)};$$

(9)

where $z = 1 - \delta (1 - \phi^n - (1 - \phi^n) \phi^n)$. We limit our attention to the empirically relevant case where $\frac{\partial \phi^n}{\partial a} < 0$ (i.e. firms’ firing behavior is countercyclical). Thus, we obtain the parameter restriction $z^2 - \delta a \Gamma' (1 - \phi^n) > 0$.

Noting that $\phi^n$ is a function of $\phi^x$, the derivative of $z$ with respect to $\phi^x$ is

$$z' = \frac{\partial z}{\partial \phi^x} = \delta \left( 1 - \phi^n + (1 - \phi^n) \frac{\partial \phi^n}{\partial \phi^x} \right),$$

(10)

and the derivative of $\Gamma$ with respect to $\phi^x$ is

$$\frac{\partial \Gamma}{\partial \phi^x} = -\Gamma' \frac{a z'}{z^2}.$$

(11)

\[12\] There is clear evidence for this in the data.
Since
\[ \frac{\partial \phi_n}{\partial \phi^x} = \frac{\Gamma' \alpha (1 - \phi^n)}{z^2 - a \delta \Gamma' (1 - \phi^x)} > 0, \] (12)
we conclude that \( z' > 0 \). In addition, \( \frac{\partial \phi_n}{\partial \phi^x} > 0 \) tells us that fewer exogenous quits will reduce firms’ firing.

This allows us to evaluate the cross-partial derivative of interest:
\[ \frac{\partial^2 \ln \phi^n}{\partial \ln a \partial \phi^x} = \frac{\partial}{\partial \phi^x} \left( \frac{\phi^n a \frac{\partial^2 \phi^n}{\partial a \partial \phi^x} - \frac{\partial \phi_a}{\partial a} a \frac{\partial \phi^x}{\partial \phi^x}}{(\phi^n)^2} \right). \] (13)

To evaluate the sign of this expression, we evaluate its different components: We know \( \frac{\partial \phi_n}{\partial \phi^x} > 0 \) and \( \frac{\partial \phi_n}{\partial a} < 0 \). Next, we look for the sign of
\[ \frac{\partial \phi_n}{\partial a \partial \phi^x} = \left( z^2 - \delta a \Gamma' (1 - \phi^x) \right) \left( -\Gamma' z' + \Gamma'' a \frac{\partial^2 \phi}{\partial x^2} \right) + z \Gamma' \left( 2z z' + \Gamma'' a^2 (1 - \phi^x) \frac{z'}{z} + \delta a \Gamma' \right) \] (14)
The denominator is positive. Thus, we evaluate the numerator, which we can simplify to
\[ \Gamma' z^2 z' + \Gamma'' a z' z + \Gamma'' a \delta (z' (1 - \phi^x) + z) \] (15)
If \( \Gamma'' \) is sufficiently small or \( \Gamma'' = 0 \) as under a uniform distribution (or as a first order approximation of any distribution) the numerator is positive and \( \frac{\partial \phi^n}{\partial \phi^x} > 0 \) and \( \frac{\partial^2 \ln \phi^n}{\partial \ln a \partial \phi^x} > 0 \).

Thus, lower quit rates imply lower firing rates (\( \frac{\partial \phi_n}{\partial \phi^x} > 0 \)) and larger fluctuations of the firing rate (\( \frac{\partial^2 \ln \phi^n}{\partial \ln a \partial \phi^x} > 0 \)), i.e. there is a connection between sclerosis and higher volatilities.

Sclerosis and Large Volatilities: Job-Finding Rate

Proof that \( \frac{\partial \eta}{\partial h} < 0 \). And proof that \( \frac{\partial \ln \eta}{\partial \ln a h} > 0 \) for \( \Gamma'' \geq 0 \) or small \( |\Gamma''| \).

The job-finding rate is
\[ \eta = \Gamma (e^h), \] (16)
where \( e^h \) is hiring cutoff point, defined by the zero profit condition:
\[ 0 = a - w (e^h) - e^h - h + \delta (1 - \phi) (a - c) + \delta^2 (1 - \phi)^2 (a - c) + \ldots \] (17)
In the same way as above (wage substitution and normalization of the idiosyncratic shock), it follows that the hiring cutoff point is
\[ e^h = \frac{a}{1 - \delta (1 - \phi)} - \frac{h}{1 - \alpha} \] (18)
and the aggregate job-finding rate is

$$\eta = \Gamma \left( \frac{a}{z} - \frac{h}{1 - \alpha} \right).$$  \hspace{1cm} (19)$$

The elasticity of the job-finding rate with respect to productivity is

$$\frac{\partial \ln \eta}{\partial \ln a} = \frac{\Gamma' (a z - a^2 \frac{\partial z}{\partial a})}{z^2 \eta} > 0,$$  \hspace{1cm} (20)$$

where $\frac{\partial z}{\partial a} = \delta (1 - \phi^x \frac{\partial \phi^x}{\partial a}) < 0$. The change of the job-finding rate with respect to $h$ is

$$\frac{\partial \eta}{\partial h} = -\Gamma' \frac{1}{1 - \alpha} < 0$$

and the derivative of $\Gamma'$ with respect to $h$ is $\frac{\partial \Gamma'}{\partial h} = -\Gamma'' 1 - \alpha$. Thus, the cross-partial derivative with respect to $h$ is

$$\frac{\partial \ln \eta}{\partial \ln a \partial h} = -\frac{z^2 \eta \Gamma'' (a z - a^2 \frac{\partial z}{\partial a}) + z^2 \Gamma'^2 (a z - a^2 \frac{\partial z}{\partial a})}{(1 - \alpha) z^4 \eta^2}$$

$$= a (\Gamma'^2 - \eta \Gamma'') (z - a \frac{\partial z}{\partial a}) (1 - \alpha) z^2 \eta^2. \hspace{1cm} (21)$$

If $\Gamma''$ is sufficiently small, the term is positive.

Thus, larger hiring costs imply smaller job-finding rates ($\frac{\partial \eta}{\partial h} < 0$) and larger fluctuations of the job-finding rate ($\frac{\partial \ln \eta}{\partial \ln a \partial h} > 0$), i.e. there is a connection between sclerosis and large volatilities.