**Appendix**

Proof that *M=0* when all industries have  :

This is immediate from the definition of *M* because when *∀* I,

 

then *ui - λvi*  = *ui  - (ui/vi)vi* = 0 .

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Proof that the maximum value of *M=1*:

 First consider the case of only two industries.

 Then

 

Using the definition of λ and expanding the expression, it is straightforward to show that

 u1 - λv1 = -(u2 - λv2)

Then M can be written as

by simply defining industry 1 as the one for which ui < λvi .

Substituting for λ, M is then



Then

So M is maximized by setting u1 = 0. Also,



so M is maximized by setting v2 = 0 . Because u1 = 0 and v2 = 0, λ = u2 / v1 so



 .

 Now, to show this in general for more than two industries, arbitrarily divide all industries into two parts and call the first part of the partition industry 1 and the second industry 2. Because there can never be more structural mismatch than that which occurs when all vacancies are in one industry and all unemployed are in the other industry, ignoring industry divisions could never increase the amount of mismatch in the economy when at full mismatch. More concretely, if v2 = 0, then the vacancies for all the industries that make up industry 2 also equal 0. Similarly, if u1 = 0, then the number of unemployed in each of the industries that make up industry 1 also equal zero. Thus, the above proof holds for any number of industries.

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Proof that increasing the number of unemployed by a scalar in each industry leaves *s* unchanged:

 Let *uit* and *vit* be unemployment and vacancy rated in industry *i* at time *t*.

 Suppose *ui1* = γ*ui0* *∀ i*.

 Then



where  and 

 Since *vi1* = *vi0* *∀ i* and *ui1* = γ*ui0* *∀ i*, λ*1* = γλ*0.*

 Thus,

 

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**Appendix Figure 1: Experienced Unemployed and Vacancies by Industry**

 **Source: CPS & JOLTS data downloaded from www.bls.gov**

**Appendix Figure 1: Experienced Unemployed and Vacancies by Industry (continued)**

**Appendix Figure 2: Experienced Unemployed and Vacancies by Occupation**

 **Source: CPS data (BLS) & HWOL data (the Conference Board)**

**Appendix Figure 2: Experienced Unemployed and Vacancies by Occupation (continued)**