



European Centre for the Development of Vocational Training

Manfred Tessaring

Supply forecast methods

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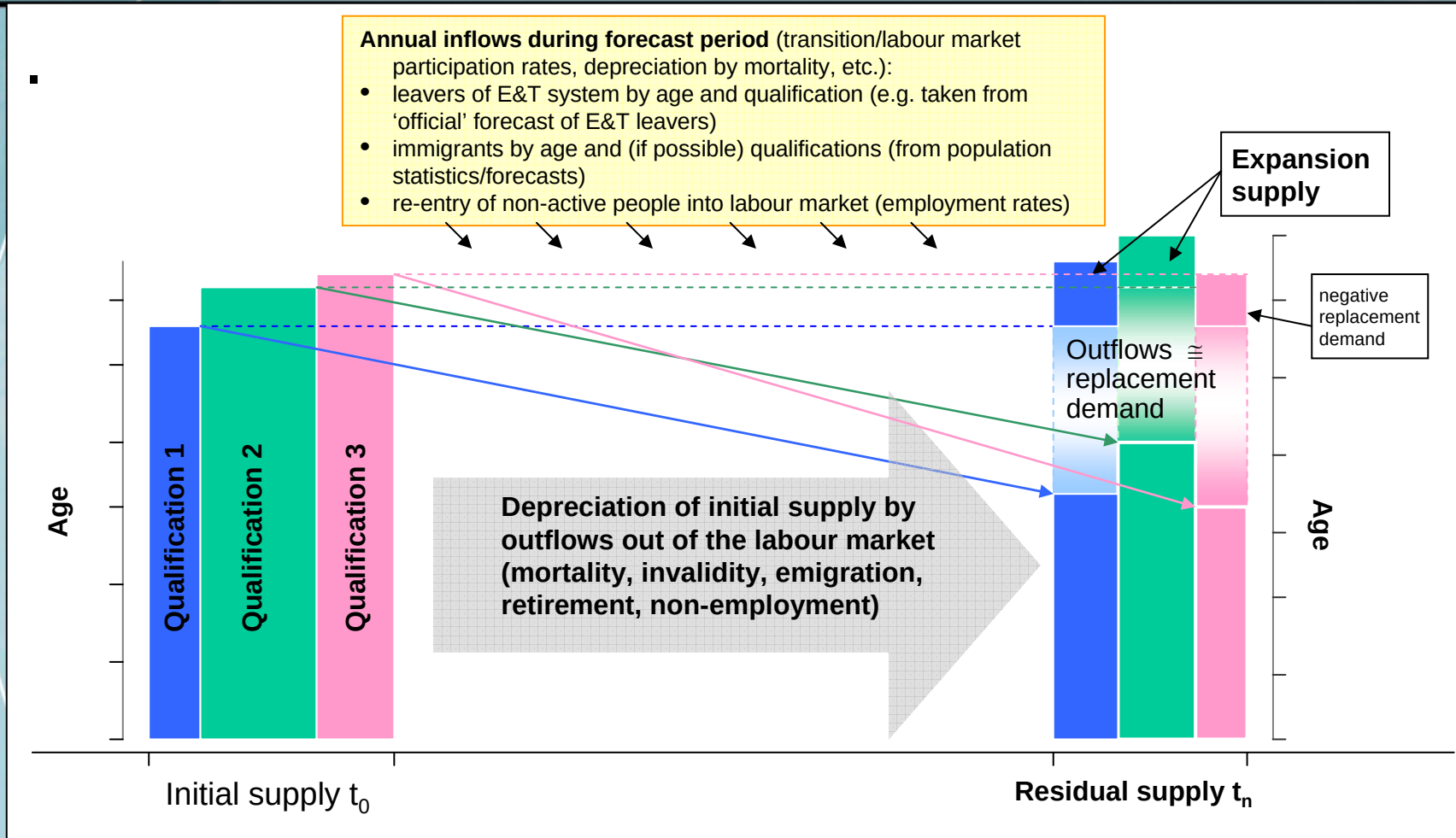
“Simple” conventional supply forecast:

- Depreciation of initial supply by outflows out of the labour market in the forecasting period
- Forecast of new supply by calculating E&T leavers, immigrants

Sophisticated supply forecast (example):

- Modelling future supply by inflow-outflow approaches, ENTROPY models, or the like
- Cohort approaches
- Econometric modelling

Conventional supply forecast



Conventional supply forecast: data requirements

- Stock of labour force by age, gender, qualification
- Mortality and invalidity rates by age and gender
- Employment rates by age, gender, qualification
- Future number of school leavers by age, gender and qualification
- Future number of immigrants by age and gender (and possibly qualification)

Estimation of stocks and flows by the ENTROPY algorithm (1)

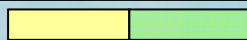
Transition matrix (for a specific year, age group, qualification and gender)

		into status ...			
From status ...	Σ initial stock t_0	Education, training (E&T)	Unemployment	Employment	Non-active
Education, training (E&T)	b^r_1	Stayers in E&T X_{11}	From E&T into unemployment X_{12}	From E&T into employment X_{13}	From E&T into non-active X_{14}
Unemployment	b^r_2	From unemployment into E&T X_{21}	Stayers in unemployment X_{22}	From unemployment into employm. X_{23}	From unemployment into non-active X_{24}
Employment	b^r_3	From employment into E&T X_{31}	From employment into unemployment. X_{32}	Stayers in employment X_{33}	From employment into non-active X_{34}
Non-active	b^r_4	From non-active into E&T X_{41}	From non-active into unemployment. X_{42}	From non-active into employment X_{43}	Stayers in non-active X_{44}
Σ final stock t_{0+1}	b^{rc}	b^c_1	b^c_2	b^c_3	b^c_4

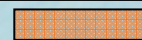
Estimation of stocks and flows by the ENTROPY algorithm (2)

Reference transition matrix U^{t-1} with heterogeneous/incomplete information

	States at t				Σ_t
States at t-1	U_{11}	$U_{12} ?$	...	U_{1i}	b^r_1
	U_{21}	U_{22}	...	U_{2i}	b^r_2
	...	...	...	...	...
	U_{j1}	U_{j2}	...	U_{ji}	b^r_j
Σ_{t-1}	$b^c_1 ?$	b^c_2	...	b^{ci}	b^{rc}



aggregate information



inequation, e.g. estimated value, values with error margin, minimum/maximum estimation, etc.

Minimise distance measure:

$$\text{Min: } D_u(X) = |X^t - U^{t-1}|$$

e.g. by
minimising the
relative entropy:

$$\text{Min: } E_u(X) = \sum_i \sum_j x_{ij} \ln(x_{ij} / u_{ij})$$

Entropy algorithm: data requirements

- Population by age, gender, qualification, status for reference year(s)
- Complete transitions between all different states (inflows, outflows), partly estimated
- Information/estimation on future margin sums (stocks) of the transition matrix
- Inflows and outflows from/into outside (immigrants, emigrants)

Entropy model (modified RAS / IPF algorithm)
with nonlinear equations or inequations

Cohort approach

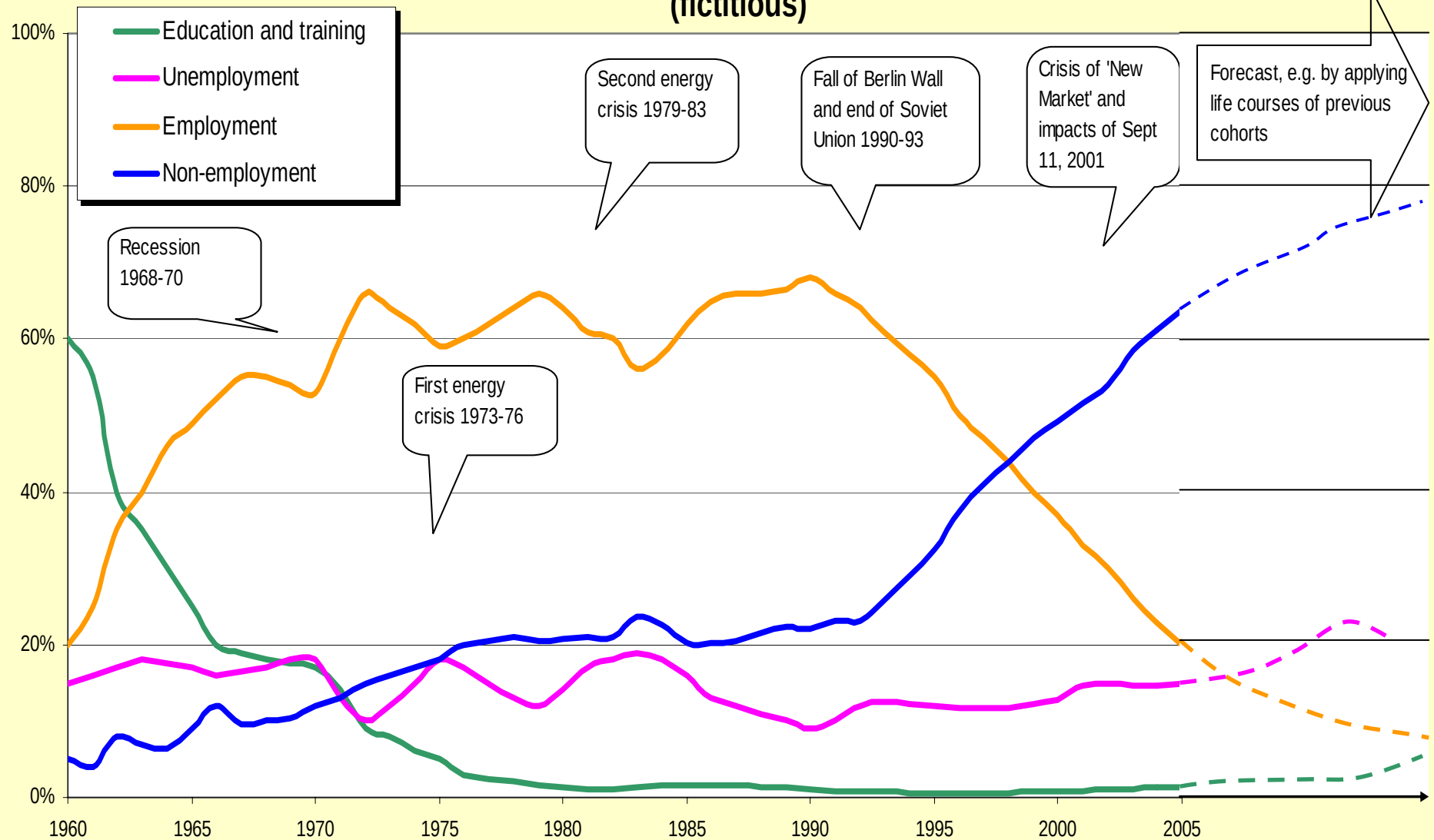
Cohort: 1950						
Period/ Year	Age	Status				
		E&T	Active	Unempl	...	Popul.
1955	5					
1956	6					
1957	7					
...	...					
2005	55					

Cohort: 1971					
Period/ Year	Age	Status			
		E&T	Active	...	Popul.
1976	5				

...

Cohort: 1995					
Year	Age	Status			
		E&T	Active	...	Popul.
2000	5				
2001	6				
2002	7				
...	...				
2005	10				

The course of the cohort born in 1945 through education/training and working life (fictitious)





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