Simulating the Economic Effects of an Employer of Last Resort Programme for Austria

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ABSTRACT

Unemployment in Austria has increased considerably since the late 1970s, reaching its climax during the recent Covid-19 crisis with 409,639 individuals being registered unemployed in 2020. Conventional policy instruments appear insufficient to effectively address the persistent rise in unemployment over the decades. An increasingly prominent policy approach is the employer of last resort (ELR) which offers public employment at a base wage to everyone willing and able to work. The aim here is to simulate the economic effects of an ELR covering all registered unemployed people in Austria in 2020 using a static input-output model. The channel through which the ELR operates is the additional income generated by employing the unemployed. This income is assumed to translate into household consumption expenditure, ultimately spurring aggregate demand. The simulation results indicate that in a middle-bound scenario with respect to the programme wage, the ELR would raise output *(Produktionswert)* by 2.2% of GDP, value added by 0.9% of GDP, employee compensation by 0.4% of GDP and non-ELR employment by a total of 36,000 full-time equivalents. The results indicate that implementing an ELR programme would not only remove involuntary unemployment but also be accompanied by beneficial macroeconomic effects.

SCHLÜSSELBEGRIFFE

Employer of Last Resort, Job Guarantee, Simulation, Input-Output, Austria

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1. Introduction

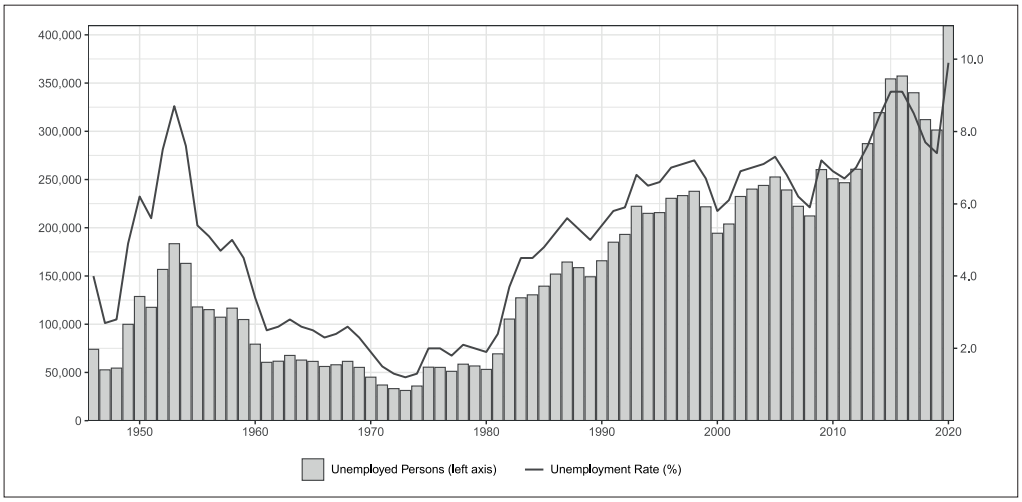
Unemployment in Austria has undergone a remarkable development since the end of the Second World War. While the first decade after the end of the war was marked by high levels of unemployment, the following post-war era from the mid-1950s onwards showed rapid economic recovery. This period was characterized by high economic growth and falling unemployment, eventually reaching full employment in the 1970s. With an unemployment rate of 1.2% and 31,327 registered unemployed, the year 1973 marked the lowest level of unemployment reached in Austria. Yet since the late 1970s, unemployment has again begun to rise from 1.9% (53,161 people unemployed) in 1980 to 7.4% (301,328 people unemployed) in 2019. Manifold reasons can be attributed to this development such as a slowdown in economic growth, departure from full employment policies, increasing labour supply or economic crises. In 2020, the worldwide Covid-19 pandemic and extensive governmental restrictions triggered a major economic downturn with unemployment levels reaching the highest observed since 1945. The unemployment rate increased to 9.9% and the number of people registered unemployed grew to 409,639 individuals.

The long-term rise in unemployment raises the question of adequate policy response since unemployment is associated not just with personal costs but also with public costs (social and economic costs). From an economic perspective, unemployment reflects an underutilization of existing resources and a potential loss in output. For instance, Mitchell (2012) estimates that the Great Recession resulted in a daily decline in real GDP of about $9.7 billion due to the increased unemployment rate in the United States. According to Watts and Mitchell's (2000) findings for Australia, achieving an unemployment rate of 2% would result in a $37.3 billion increase in output, equivalent to 6.6% of nominal GNP. Furthermore, unemployment constitutes a major determinant of poverty as it is typically accompanied by a substantial loss in income. The at-risk-of-poverty rate among the unemployed in the working age population lies at 40% compared to the national average of 13% (Statistics Austria, 2022). Longer periods of unemployment increase this rate even further.

At the individual level unemployment can negatively affect a person's physical and mental health (Brand, 2015; Krug and Eberl, 2018). The pioneering field study of Jahoda et al. (1975) demonstrated the detrimental effects of extended periods of unemployment on individuals, including symptoms such as depression, resignation, and apathy. In addition, the study highlighted the negative impact of unemployment on the local society. Periods of joblessness can also result in long-lasting effects on future earnings. Arulampalam (2001) found that unemployed individuals in Great Britain experience a wage penalty of 6% after they re-enter the workforce compared to their potential wages had they not been unemployed. Likewise, Gregg and Tominey (2005) show that experiences of unemployment during one's youth can lead to a significant decrease in future wages, developing a wage scar ranging from 13% to 21% at the age of 42. Nüß (2018) demonstrated that prolonged periods of unemployment can result in skill decay and labour market discrimination, which in turn reduce an individual's likelihood of being re-employed in the future. This likelihood of being re-employed was estimated by Eppel

et al. (2018) for Austria. They find a probability of 3.0% for long-term unemployed people finding employment in the following month, compared to 14.2% for the short-term unemployed. Moreover, unemployment also correlates with life expectancy, as was shown by Singh and Siahpush (2016). They identified a significant and adverse link between unemployment and life expectancy in the United States. The study revealed a strong negative correlation between the two, indicating that a higher unemployment rate is associated with a lower life expectancy.

Figure 1: Unemployment in Austria from 1946 to 2020



Source: AMS (2020), own representation.

Unemployment entails a variety of noteworthy consequences both on the personal and the public level. The employer of last resort (ELR) concept is a policy instrument that is gaining increasing attention in the scientific debate. It was revived by early post-Keynesian writers and has been developed further since then (for example in Minsky, 1968; Wray, 1997; and Tcherneva, 2019). The ELR aims to eliminate unemployment as the government offers a job to everyone willing and able to work at a base wage above the poverty line. It would act as an automatic stabilizer over the business cycle; however, instead of stimulating aggregate demand for goods and services, the demand for (unemployed) labour is spurred. In contrast to a traditional Keynesian demand stimulus, the advantage of the ELR lies in its direct impact on the unemployment rate. In the economic downturn the ELR would grow in size, whereas in the upswing it would shrink again as the private sector would hire those involved in the programme. The ELR would provide full employment, improve labour market conditions, decrease poverty and remedy some of the negative consequences of unemployment.

Examples of public job creation are manifold. Historically well-known large-scale public employment programmes were implemented in the context of President Franklin D. Roosevelt's

New Deal in the United States during the 1930s. They include the Works Progress Administration (WPA) which employed more than 8 million people for infrastructure projects. Argentina's Plan Jefes in 2001 put 2 million people in work, reflecting 5% of the population and 13% of the total labour force. An overview of international public job creation programmes can be found in Papadimitriou (2008). For the Austrian context, large public employment programmes involve the Aktion 8,000 during the 1980s and the Aktion 20,000 in 2017. The latter aimed at reducing long-term unemployment among individuals aged 50 and above but was abolished shortly after the start of the programme due to a change in government. Yet evaluation studies suggest markedly positive effects on the labour market reintegration and well-being of programme participants at relatively low fiscal costs (Hausegger and Krüse, 2019; Walch and Dorofeenko, 2020). More recently, the world's first pilot project of a universal job guarantee for long-term unemployed people was started in 2020 in the historic region of Gramatneusield in Lower Austria, where the studies of Jahoda et al. (1975) took place about 100 years before. The pilot aims at eliminating long-term unemployment in the region and offers a job in the public or private sector to everyone willing to work. A first evaluation study suggests a significant reduction in long-term unemployment and a causal impact of the programme (Kasy and Lehner, 2022).

This article aims to simulate the impact an employer of last resort programme would have had on the Austrian economy if all people registered unemployed in the year 2020 had received a public job at a base wage. In particular, the effects on output *(Produktionswert),* value added, employee compensation and additional employment are examined. The channel through which the ELR affects the economy is a stimulus of final household consumption expenditure as the programme wage is assumed to lie above current unemployment benefits. The simulation is conducted by means of a national input-output table for the year 2017.

2. Overview of simulation studies

A brief overview of some existing simulation studies on the employer of last resort approach is provided in the following. Dominant modelling strands are depicted in table 1 and include the macroeconometric US-Fair Model, stock-flow consistent frameworks, input-output analyses and microsimulations.

Studies using the macroeconometric US-Fair model (Fair, 2004) represent a common modelling approach especially for the United States. Majewski and Nell (2000) carried out the first simulation for the US spanning the period from 1989 to 2004. They show that an ELR would increase output and overall employment with minimal impact on prices. Since private sector employment would also increase, the reduction in the unemployment rate would surpass the number of individuals employed in the ELR. Public sector employment would have peaked at about 1.6 million during the recession of the early 1990s and fall to less than 400,000 in 2002. Programme spending would vary between 0.5% and 0.9% of GDP. If increasing tax receipts and extra output generated are considered, the benefits of the programme would exceed its costs. Subsequent studies for the United States were conducted by Majewski (2004), Fullwiler (2007, 2013), Mur-

ray (2017), and Wray et al. (2018). More recently, Mario (2021) performed simulations for the Argentine economy from 2003 to 2015 using an adapted version of the US-Fair model. He finds 4.4 million jobs being created at the peak of the programme and an average annual increase in real GDP of 5.4% over the simulated period. Total ELR-related spending would amount to 1.2% of GDP on average.

Table 1: Selected simulation studies on the employer of last resort approach (ordered by method)

Author	Year	Country	Method	Main findings
Majewski and Nell	2000	USA	US-Fair model	Simulated period 1989–2004 0.4 million to 1.6 million ELR jobs, varying with the historical business cycle Increase in real GDP ELR-related net spending between 0.5% and 0.9% of GDP Modest effects on inflation
Majewski	2004	USA	US-Fair model	
Fullwiler	2007	USA	US-Fair model	Simulated period 1985–2005 1 million to 9 million ELR jobs, varying with the historical business cycle 1.3 million to 2.1 million additional private sector jobs permanently created Increase in real GDP ELR-related spending between 0.6% and 1.25% of GDP One-time increase in price level, no inflationary pressure
Fullwiler	2013	USA	US-Fair model	*Similar to Fullwiler (2007) but using a multi-country model and an expanded simulation period (1983–2010)*
Murray	2017	USA	US-Fair model	Simulated period 2011–2020 About 8 million to 13 million ELR jobs Average increase of real GDP by 5.8% over the simulated period ELR is modelled budget-neutrally and financed by increased personal income taxes. It is shown to still be effective at promoting full employment and economic growth

Author	Year	Country	Method	Main findings
Wray et al.	2018	USA	US-Fair model	Simulated period 2018–2027 11.6 million to 15.4 million public sector jobs at its peak in the lower and higher bound estimate, respectively 2.95 million to 3.65 million permanent private sector jobs in the lower and higher bound estimate, respectively Increase in real GDP by $445 billion and $560 billion per year ELR-related net spending averages 1.53% of GDP in the first five years and 1.13% of GDP in the last five years of the programme (higher bound estimate) Modest effects on inflation
Mario	2021	Argentina	US-Fair model (adapted)	Simulated period 2003–2015 4.4 million ELR jobs at the peak of the programme 1.6 million additional non-ELR jobs on average during the simulated period Annual increase in real GDP averages 5.4% ELR-related spending of 1.2% on average Effects on inflation
Godin	2013	-	Stock-flow consistent model	Green job ELR removes involuntary unemployment, decreases poverty as well as carbon dioxide emissions ELR-related spending would increase by 6% 0.4% increase in debt to GDP ratio
Godin	2014		Stock-flow consistent model	Comparison of ELR with traditional demand stimulus ELR is more efficient at tackling poverty and income inequality but less effective at attaining economic growth Achieving full employment through ELR could be possible while maintaining a balanced budget and with no inflationary pressure
Papadimitriou	2008	USA	No model used	7 million ELR jobs Increase in GDP ELR-related spending below 1% of GDP

Author	Year	Country	Method	Main findings
Tamesberger and Theurl	2019, 2021	Austria	No model used	40,000 ELR jobs for long-term unemployed people ELR-related net spending below 1% of GDP
Antonopoulos et al.	2014	Greece	Input-output model	300,000 ELR jobs and additional 93,402 private sector jobs Increase in GDP by 4.2% ELR-related gross (net) spending of 3.2% (1%) of GDP
Murray	2012	Missouri, USA	Input-output model	426,150 ELR jobs Increase in output by $5.2 billion, in private sector earnings by $1.2 billion and additional 441,005 private sector jobs ELR-related spending of $2.58 billion
Heinzle	2020	Austria	Input-output model	150,000 ELR jobs for long-term unemployed people Increase of €3.54 billion in output, €2.63 billion in GDP, €0.9 billion in employee compensation and 0.27 equivalents of CO2 Greenhous gas emissions are shown to be lowest in an ELR scenario compared to other scenarios
Picek	2020	Austria	No model used	150,000 ELR jobs for long-term unemployed people ELR-related net spending between 0.19% and 0.36% of GDP
Haim	2021	Austria	Microsimulation	169,460 to 613,483 ELR jobs 10.8% to 29.0% reduction in the share of people at risk of poverty 1.5% to 3.5% drop in income inequality (GINI coefficient) ELR-related net spending between 0.9% and 3.7% of GDP
Premrov et al.	2022	Austria	Microsimulation	150,000 ELR jobs for long-term unemployed people 7% to 8% reduction in the share of people at risk of poverty, depending on the programme wage Self-financing rate of 67.9% to 69.6%, depending on the programme wage

Source: own representation.

The employer of last resort approach has also been examined within stock-flow consistent frameworks. Godin (2014) does so and compares the results to a traditional Keynesian demand stimulus. He finds that an ELR would be more efficient at tackling poverty and income inequality but less effective at attaining economic growth. With respect to inflation, the ELR is shown to be more flexible, leading to lower inflation rates. He demonstrates that achieving full employment through an ELR would be possible while maintaining a balanced budget and without having inflationary pressure. In addition, he models a green job ELR which would remove involuntary unemployment and decrease poverty while also reducing carbon dioxide emissions (Godin, 2013). The implementation would increase government spending by 6%, leading to a 0.4% increase in debt to GDP ratio.

Another strand of modelling involves input-output analyses. Antonopoulos et al. (2014) employ an input-output model for Greece to simulate the effects of an ELR on GDP and private sector employment varying the size and wage rate of the programme. In a middle-bound scenario of 300,000 directly created ELR jobs, they find an increase in GDP of 4.2%, the creation of an additional 93,402 private sector jobs and gross (net) costs of 2.3% (1%) of GDP. In a similar vein, Murray (2012) estimates the impact of an ELR for the US state of Missouri based on multipliers from an input-output model. He finds a $5.2 billion increase in output, a $1.2 billion increase in private sector earnings and an additional 441,005 private sector jobs due to the extra household consumption expenditure out of ELR wages. Papadimitriou (2008) conducts a rough estimation of an ELR implementation in the US with 7 million workers being employed, comprising a total annual wage bill of $145.6 billion. He finds an increase of 2% in GDP and annual programme costs below 1% of GDP.

Simulations have also been carried out for the Austrian context. Heinzle (2020) estimates the economic effects of a job guarantee for 150,000 long-term unemployed people in Austria by conducting an input-output analysis. He finds an increase of €3.54 billion in output, €2.63 billion in GDP and € 0.9 billion in employee compensation. Picek (2020) proposes a job guarantee for 150,000 long-term unemployed people and estimates net costs between €0.68 and €1.34 billion (0.19% to 0.36% of GDP) depending on the programme wage. Building on his work, Tamesberger and Theurl (2019, 2021) follow a similar approach estimating the net costs of a job guarantee for 40,000 long-term unemployed people at €0.33 billion (below 1% of GDP) for the first year.

Moreover, Haim (2021) conducts microsimulations of a universal job guarantee in Austria with 169,460 to 613,483 people entering the programme. He finds that the overall share of people at risk of poverty could be reduced by between 10.8% and 29.0% and income inequality as measured by the GINI coefficient could drop by 1.5% to 3.5%. Net costs would vary between 0.9% and 3.7% of GDP depending on the eligibility criteria of the programme. Likewise, Premrov et al. (2022) carried out microsimulations of a job guarantee for 150,000 long-term unemployed people in Austria. They find a reduction in the at-risk-of-poverty rate of 7% to 8% and a self-financing rate of 67.9% to 69.6% depending on the programme wage.

The presented simulation studies suggest that implementing an employer of last resort pro-

gramme would remove involuntary unemployment, mitigate poverty and reduce income inequality, while incurring only moderate fiscal costs. An ELR would also be accompanied by a positive macroeconomic impact on output, employee compensation and private sector employment.

3. Input-output model

The economic effects here are simulated using an input-output model. For that purpose, the domestic table of the 2017 input-output table published at production prices and in CPA classification (Statistical Classification of Products by Activity) by Statistics Austria is used. The input-output table essentially consists of three parts. First, a symmetric n x n interindustry transaction matrix (i) with producing sectors in the rows and consuming sectors in the columns. This matrix represents the whole process from the origin to the destination of goods and services used within production (Miller and Blair, 2009). The interindustry transaction matrix comprises 65 product groups which were aggregated to 20 product groups consistent with the top-level CPA classification (ibid, pp. 160–168). Second, the input-output table consists of a final demand (ii) block which depicts the purchase of goods and services by households, firms, the government and abroad. These are represented in additional columns next to the interindustry transaction matrix and broadly summarized for the underlying case. Third, a value-added (iii) block at the bottom of the table consists of the compensation of employees, other net taxes on production, consumption of fixed capital and operating surplus. The table is fully consistent as summing over rows and columns yields equal figures for each sector.

Figure 2: Simplified version of an input-output table

<table>
<tr><th></th><th>Agric.</th><th>Mining</th><th>Manuf.</th><th>Constr.</th><th>Transp.</th><th>Services</th><th>Other</th><th>Consump-tion</th><th>Invest-ment</th><th>Net ex-ports</th></tr>
<tr><td>Agriculture</td><td colspan="7" rowspan="7">(i) Interindustry transaction matrix</td><td colspan="3" rowspan="7">(ii) Final demand</td></tr>
<tr><td>Mining</td></tr>
<tr><td>Manufacturing</td></tr>
<tr><td>Construction</td></tr>
<tr><td>Transportation</td></tr>
<tr><td>Services</td></tr>
<tr><td>Other</td></tr>
<tr><td>Compensation of employees</td><td colspan="7" rowspan="4">(iii) Value added</td><td colspan="3" rowspan="4"></td></tr>
<tr><td>Other taxes on production</td></tr>
<tr><td>Consumption of fixed capital</td></tr>
<tr><td>Operating surplus</td></tr>
</table>

Source: own representation.

The input-output model here is closed with respect to firms, which means that private investment out of the operating surplus is considered to occur. The underlying rationale is that an exogenous increase in final (household consumption) demand raises profits and hence induces investment expenditures. The input-output model relies on basic modelling assumptions, the most important of which are:

(1) A fixed input structure. The mix of intermediate consumption of goods and services remains unchanged; no substitution effect exists.

(2) Constant returns to scale. Changes in exogenous final demand are always proportional to changes in the outcome variable.

(3) Stability. The relationship between producers and consumers remains stable over time. It is therefore assumed that the input-output table for the year 2017 can be used to examine the economic effects in 2020.

(4) No supply constraints. Inputs such as raw materials or labour can be supplied without limits at the current price.

4. Programme design and assumptions

Existing employer of last resort proposals for Austria mainly target the long-term unemployed (for example, Picek, 2020; Tamesberger and Theurl, 2019, 2021). The aim here is to provide estimates on the impact of an ELR covering all people registered unemployed in 2020. Potential programme effects on macroeconomic variables such as output *(Produktionswert),* value added, employee compensation and additional non-ELR employment are examined. The design of the simulated ELR as well as underlying assumptions are explained in the following.

The ELR is supposed to be universal in the sense that every unemployed person willing to work will be offered a public job. It will be assumed that everyone registered unemployed participates in the programme. This assumption is rather optimistic as one may expect at least some unemployed people not to enter the programme. Two main reasons can be postulated: first, unemployed individuals whose reservation wage exceeds the programme wage and/or who find the working conditions unattractive are likely to stay outside the programme; second, the programme is likely to be avoided by unemployed individuals who have a strong chance of quickly finding employment again. Since the aim here is to simulate the macroeconomic effects of an ELR encompassing all people registered unemployed it is assumed that all 409,639 unemployed individuals in 2020 participate in the programme. Inactive individuals who are willing to work but not actively seeking *(Stille Arbeitsmarktreserve)* as well as underemployed individuals are not considered in this analysis. Incorporating them would lead to a rise in the absolute impact of the programme while keeping the relative impact (that is, the multipliers) unchanged. It will further be assumed that all participants receive an equal monthly gross wage of €1,500 (net €1,237), which amounts to an annual wage of €21,000 (net €17,308). The wage is paid 14 times a year and reflects the minimum wage floor for full-time employment in collective bargaining agreements in Austria. It is thus implicitly assumed that all unemployed people would work on a full-time basis. The propensity to consume out of the additional ELR income is assumed to be roughly 92%. This is the inverse of the saving rates estimated in Fessler and Schürz (2017) and a reasonable value to assume for individuals located at the bottom of the income distribution.

The channel through which the ELR impacts the economy essentially follows the argument in Murray (2012). Once the unemployed participate in the programme, they are paid a programme wage instead of unemployment benefits, thereby increasing their net income. The additional income flows into the consumption of goods and services. This rise in final household consumption demand translates into additional output, value added, employee compensation and non-ELR employment.

5. Estimating additional consumption

Since only the *additional* net income from the employer of last resort programme is of interest here, existing unemployment benefits must be subtracted from the ELR net wage. Hence, the ELR wage does not add to existing benefits but is assumed to replace them. A yearly gross wage

of €21,000 is defined, which amounts to a net wage of €17,308. Most of the unemployed receive some sort of unemployment benefits. The total number of 409,639 registered unemployed in 2020 can be split into three groups: (i) recipients of unemployment benefits *(Arbeitslosengeld),* (ii) recipients of unemployment assistance *(Notstandshilfe)* and (iii) the unemployed who have no entitlement to benefits. The former comprised 184,717 individuals (45.1% of total unemployment) with an average daily allowance of €33.12, whereas the group receiving unemployment assistance comprised 177,444 individuals (43.3%) and had an average daily allowance of €29.06. Unemployed people with no entitlement to benefits amounted to 47,478 (11.6%) individuals. Daily allowances are multiplied by 365 for yearly allowances, subtracted from the yearly ELR net wage and multiplied by the number of individuals in the respective group. This results in an estimation of total additional income from the ELR. The additional income is then multiplied by the propensity to consume to receive additional consumption expenditure. In total, about €2.725 billion of additional private consumption expenditure is generated from the ELR by employing 409,639 people registered unemployed in 2020.

These €2.725 billion are used as exogenous household consumption demand to simulate the economic effects of the ELR programme. Consumption is distributed along CPA product groups according to the shares of the final household consumption expenditure vector from the input-output table depicted in table 2. Total national household consumption expenditure from the national table amounts to €141.111 billion. The largest shares occur in real estate services including imputed rents (€33.251 billion or 23.6%), wholesale and retail trade services (€30.745 billion or 21.8%) and accommodation and food services (€23.147 billion or 16.4%). Together these three account for about 62% of total final household consumption. The €2.725 billion are allocated along these shares as depicted in the last column of table 2. It is thus assumed that ELR participants essentially have the same spending pattern as Austrian households on aggregate.

Table 2: Distribution of additional household consumption expenditure

	Product group (CPA)	Final household consumption (mil €)	Share (%)	Additional consumption from the ELR (mil €)
A	Agriculture, forestry and fishing	1,190.0	0.8	23.0
B	Mining and quarrying	16.2	0.0	0.3
C	Manufactured products	9,056.9	6.4	174.9
D	Electricity	4,273.3	3.0	82.5
E	Water supply	0.0	0.0	0.0
F	Construction	774.4	0.5	15.0
G	Wholesale and retail trade services	30,745.5	21.8	593.7
H	Transportation and storage services	7,513.7	5.3	145.1
I	Accommodation and food services	23,146.6	16.4	447.0

J	Information and communication services	3,438.9	2.4	66.4
K	Financial and insurance services	6,622.0	4.7	127.9
L	Real estate services	33,250.5	23.6	642.1
M	Professional services	844.5	0.6	16.3
N	Administrative and support services	4,538.3	3.2	87.6
O	Public administration and defence	78.8	0.1	1.5
P	Education services	1,924.5	1.4	37.2
Q	Human health and social work	6,110.0	4.3	118.0
R	Arts and entertainment services	3,931.8	2.8	75.9
S	Other services	3,481.8	2.5	67.2
T	Services of households as employers	172.9	0.1	3.3
	Total	141,110.7	100.0	2,724.9

Source: Statistics Austria (2020), own calculation.

6. Simulation results

The additional household consumption expenditure generated by the employer of last resort programme unfolds multiplicative effects due to economic linkages. For example, when final consumption demand in wholesale and retail trade services rises, producers need to increase their purchases from suppliers in order to meet the new demand. Then the suppliers, too, must increase their purchases and so on. This direct and indirect increase in production is captured by the multiplier. Since the underlying model is closed with respect to firms, induced investment effects out of capital income are considered as well. Table 3 depicts the multipliers for output *(Produktionswert),* value added, employee compensation and employment (self- and non-self-employment) in full-time equivalents. An increase in final household consumption demand for accommodation and food services (I) in the amount of €1 million increases output by €2.33 million, value added by €1.02 million, compensation of employees by €0.47 million and employment by 13 full-time equivalents. The last row of the table depicts total multipliers of final household consumption demand.

Table 3: Estimated multipliers

	Product group (CPA)	Output	Value added	Employee compensation	Employment (fte)
A	Agriculture, forestry and fishing	3.34	1.08	0.35	26
B	Mining and quarrying	2.97	0.99	0.40	7
C	Manufactured products	2.02	0.62	0.32	7
D	Electricity	3.49	0.78	0.34	5
E	Water supply	3.02	1.08	0.43	9
F	Construction	2.48	0.88	0.48	11
G	Wholesale and retail trade services	2.15	0.96	0.53	12
H	Transportation and storage services	2.38	0.99	0.49	11
I	Accommodation and food services	2.33	1.02	0.47	13
J	Information and communication services	2.18	0.88	0.48	8
K	Financial and insurance services	2.11	0.97	0.56	8
L	Real estate services	3.06	1.24	0.31	7
M	Professional services	2.24	1.00	0.53	11
N	Administrative and support services	2.13	1.03	0.53	13
O	Public administration and defence	1.82	1.01	0.68	12
P	Education services	1.50	1.01	0.79	14
Q	Human health and social work	1.85	0.98	0.63	14
R	Arts and entertainment services	2.39	1.06	0.48	12
S	Other services	2.09	1.03	0.57	17
T	Services of households as employers	1.00	1.00	1.00	26
	Total final HH consumption multiplier	2.43	1.02	0.45	10

Source: Statistics Austria (2020), own calculation. Explanation: An increase in final household consumption demand for accommodation and food services in the amount of €1 million increases output by €2.33 million, value added by €1.02 million, compensation of employees by €0.47 million and employment by 13 full-time equivalents (abbreviated in the table as fte).

The largest output multipliers are found in electricity (D), agriculture, forestry and fishing (A) and real estate services (L). Output multipliers always exceed unity since the amount produced must be at least the additional final demand initially required. With respect to value added, it is real estate services (L), agriculture, forestry and fishing (A) and water supply (E) that have the largest multipliers. Regarding compensation of employees, the highest multipliers occur in services of households as employers (T), education services (P) and public administration and defence (O) which have the highest share of labour income in total output. Services of households as employers have a multiplier of one since no inputs for production are required and output consists entirely of employee compensation. Employment multipliers are the highest

in agriculture, forestry and fishing (A), services of households as employers (T) and other services (S)[1] which are highly labour intensive.

Based on these multipliers, the effects of the employer of last resort programme can be estimated. The additional ELR consumption expenditure of product group I in table 2 is multiplied by the respective multiplier of I in table 3 to obtain the economic effect depicted in table 4. Of the €2.725 billion increase in final household consumption expenditure, total output would increase by €6.626 billion, total value added by €2.771 billion, total employee compensation by €1.236 billion and total employment by 28,569 full-time equivalents. The additional employment reflects jobs created on top of the ELR jobs. Overall employment would rise by 409,639 ELR employees plus about 29,000 full-time equivalents created due to an increase in final consumption expenditure. Where does the additional employment come from? Potential channels could be (i) involuntary part-time workers who increased their working hours, (ii) individuals outside the labour force, (iii) other registered statuses at the Public Employment Service Austria (AMS) such as training, or (iv) from abroad.

The highest economic effects occur for real estate services (L), wholesale and retail trade services (G) and accommodation and food services (I) as these constitute the largest proportion of additional consumption expenditure. For wholesale and retail trade alone, roughly 7,000 full-time equivalents are created. Real estate services (including imputed rents) represent the largest proportion of private consumption but have a relatively low labour intensity which is why less employee compensation and physical employment is created. However, with respect to output and value added, real estate services yield the largest impact. In sum, these three services account for up to two-thirds of total additional output (64.7%), value added (65.6%), employee compensation (58.5%) and non-ELR employment (60.7%).

1 Other services (S) comprise, for example, services by membership organizations and personal services such as hairdressers, laundry services or funeral services.

Table 4: Estimated economic effects

	Product group (CPA)	Output (mil €)	Value added (mil €)	Employee compensation (mil €)	Employment (fte)
A	Agriculture, forestry and fishing	76.8	24.9	7.9	608
B	Mining and quarrying	0.9	0.3	0.1	2
C	Manufactured products	353.4	108.3	56.4	1,190
D	Electricity	287.7	64.4	28.3	449
E	Water supply	0.0	0.0	0.0	0
F	Construction	37.1	13.2	7.2	159
G	Wholesale and retail trade services	1,275.3	568.0	314.7	7,222
H	Transportation and storage services	344.8	143.9	71.8	1,535
I	Accommodation and food services	1,042.3	456.1	212.2	5,858
J	Information and communication services	144.7	58.2	31.7	563
K	Financial and insurance services	270.1	124.2	71.4	1,064
L	Real estate services	1,966.9	794.7	196.3	4,259
M	Professional services	36.6	16.2	8.7	181
N	Administrative and support services	186.8	90.2	46.4	1,152
O	Public administration and defence	2.8	1.5	1.0	19
P	Education services	55.8	37.7	29.2	528
Q	Human health and social work	218.4	116.2	74.2	1,612
R	Arts and entertainment services	181.2	80.6	36.8	941
S	Other services	140.6	69.1	38.4	1,140
T	Services of households as employers	3.3	3.3	3.3	88
	Total	6,625.5	2,771.1	1,235.9	28,569

Source: Statistics Austria (2020), own calculation. Differences may occur due to rounding errors. The abbreviation "fte" stands for full-time equivalent.

7. Variation in the programme wage

The estimation so far assumed a monthly gross wage of €1,500, reflecting the minimum wage in collective bargaining agreements in Austria. Relative to GDP, the ELR could generate additional output of 1.7%, value added of 0.7% and employee compensation of 0.3% of GDP. Additional non-ELR employment could amount to roughly 29,000 full-time equivalents. Since the total impact of the ELR varies with the programme wage, a monthly gross programme wage of €1,700 and of €1,900 is added to the analysis to provide a middle and upper bound scenario; this is depicted in table 5. In the middle and upper bound scenario, the yearly consumption of the ELR wage amounts to €3.42 billion and €3.995 billion, respectively. Since the spending pattern

remains unchanged, the multipliers stay the same. The generated additional output increases to 2.2% (2.6%), value added to 0.9% (1.1%) and employee compensation to 0.4% (0.5%) of GDP in the middle (upper) bound scenario. The additional employment would rise by about 36,000 (42,000) full-time equivalents.

Table 5: Economic effects varying the ELR programme wage

		ELR stimulus (mil €)	Multiplier	Total effect	
				mil € or fte	% of GDP
Monthly gross wage of €1,500	Output	2,724.9	2.43	6,625.5	1.7
	Value added	2,724.9	1.02	2,771.1	0.7
	Employee comp.	2,724.9	0.45	1,235.9	0.3
	Employment (fte)	2,724.9	10	28,569	-
Monthly gross wage of €1,700	Output	3,420.0	2.43	8,315.5	2.2
	Value added	3,420.0	1.02	3,477.9	0.9
	Employee comp.	3,420.0	0.45	1,551.0	0.4
	Employment (fte)	3,420.0	10	35,856	-
Monthly gross wage of €1,900	Output	3,995.3	2.43	9,714.3	2.6
	Value added	3,995.3	1.02	4,062.9	1.1
	Employee comp.	3,995.3	0.45	1,812.0	0.5
	Employment (fte)	3,995.3	10	41,887	-

Source: Statistics Austria (2020), own calculation. Differences in total effects may occur due to rounding errors. The abbreviation "fte" stands for full-time equivalent.

8. Discussion

Unemployment in Austria has gone through a remarkable development since the end of the Second World War. The post-war era of the mid-1950s and 1960s was characterized by economic recovery leading to a decade of full employment in the 1970s. During that time the unemployment rate fell below 3%. However, by the beginning of the 1980s unemployment had again begun to rise steeply. The Covid-19 crisis exacerbated labour market tensions, leaving 409,639 people registered unemployed in 2020.

The employer of last resort (ELR) approach presents a potential cure for the problem of unemployment as it offers a public job to everyone willing to work at a base wage. Studies on the ELR for the Austrian context have been conducted by Tamesberger and Theurl (2019), Picek (2020), Haim (2021) and Premrov et al. (2022). These primarily focus on estimating the net costs of an

ELR programme for long-term unemployed people and its potential for a reduction in poverty and income inequality. Heinzle (2020) examines the macroeconomic effects for the Austrian economy of an ELR for long-term unemployed people with respect to output, GDP, compensation of employees and CO2 equivalents. The aim here was to estimate the economic effects of an ELR programme encompassing all people registered unemployed. For that purpose, an input-output analysis was carried out with the underlying rationale that the ELR creates additional income that flows into the consumption of goods and services and thereby stimulates the economy.

In a lower bound scenario of a monthly gross wage of €1,500, the additional output would amount to 1.7%, value added to 0.7% and employee compensation to 0.3% of GDP. About 29,000 full-time equivalent jobs would be created on top of the 409,639 employed by the ELR programme, which is an increase of 7.1%. In a middle (upper) bound scenario of a monthly gross wage of €1,700 (€1,900) output, value added and employee compensation would amount to 2.2% (2.6%), 0.9% (1.1%) and 0.4% (0.5%) of GDP, respectively. Employment would rise by roughly 36,000 (42,000) full-time equivalents, representing additional non-ELR employment of 8.8% (10.2%). The findings indicate that an ELR programme could yield considerable positive impacts on the economy, over and above eliminating involuntary unemployment.

Yet it is important to bear in mind that these estimations represent a theoretical scenario which explores hypothetical possibilities. Several aspects of a theoretical and practical nature associated with implementing a large-scale public employment programme have remained outside the scope of the simulation. These involve estimates about the total costs of such a programme as well as its financing. Different methods of financing may affect the economic impact of the programme. Existing studies for Austria suggest modest net costs of a job guarantee for the long-term unemployed (Picek, 2020; Tamesberger and Theurl, 2019, 2021; Haim, 2021) and a high self-financing rate (Walch and Dorofeenko 2020; Premrov et al. 2022). With respect to programme participation, it was assumed here that all unemployed people would enter the ELR programme, which is quite optimistic. There are at least two main arguments that oppose this view. First, unemployed individuals whose reservation wage exceeds the programme wage and/or who find the working conditions unattractive are likely to stay outside the programme. Second, the programme is likely to be avoided by unemployed individuals who have a strong chance of quickly finding employment again. In addition, it is implicitly assumed that participants are employed full-time as they receive a full-time wage. However, in practice, there might be individuals who prefer or are obliged to work on a part-time basis. Another important aspect relates to the types of jobs to be created. Ideally, these jobs should be socially useful, in places where they are needed and taking people as they are (Haim, 2021) which poses an additional challenge for the practical implementation of the programme. Certainly, there is a large potential for future employment to help combat the issues of climate change, an ageing society, an increasing demand for healthcare, schooling, housing and so on. Moreover, the permanent adoption of an ELR programme may affect the price and wage structure of the economy and could be accompanied by displacement effects for the private sector. Such long-run effects

have not been analysed at present. To the best of the author's knowledge these have not been investigated for the Austrian context and should be considered a subject for future research.

From a modelling perspective, it is worth noting at least two central aspects for future refinement. First, exogenous final household consumption expenditure should ideally reflect the spending pattern of low-income households. Due to data limitations, it has been assumed here that the consumption expenditure of low-income households equals the expenditure of the average household. Second, the analysis is constrained to people registered unemployed, thereby not considering inactive and underemployed individuals or individuals in training. Including them in the analysis would increase the total effects of the programme while keeping multipliers unchanged. This is another recommended subject for further research.

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REFERENCES

AMS (2020). Arbeitsmarktservice Österreich (Public Employment Service Austria).

Antonopoulos, R., Adam, S., Kim, K., Masterson, T. and Papadimitriou, D. B. (2014). "After Austerity: Measuring the Impact of a Job Guarantee Policy for Greece". Public Policy Brief, No. 138, Levy Economics Institute of Bard College, Annandale-on-Hudson, NY.

Arulampalam, W. (2001). "Is Unemployment Really Scarring? Effects of Unemployment Experiences on Wages", The Economic Journal, 111 (475), 585–606.

Brand, J. E. (2015). "The Far-Reaching Impact of Job Loss and Unemployment", Annual Review of Sociology, 41, 359–375.

Eppel, R., Famira-Mühlberger, U., Horvath, T., Huemer, U., Mahringer, H., Eichmann, H. and Eibl, J. (2018). Anstieg und Verfestigung der Arbeitslosigkeit seit der Wirtschaftskrise. Entwicklung, Ursachen und die Rolle der betrieblichen Personalrekrutierung Synthesebericht. WIFO, WIFO Studies No. 62227, June.

Fair, R. C. (2004). Estimating How the Macroeconomy Works. Cambridge, MA: Harvard University Press.

Fessler, P., and Schürz, M. (2017). "Zur Verteilung der Sparquoten in Österreich", Monetary Policy & the Economy, Oesterreichische Nationalbank (Austrian Central Bank), 3, 13–33.

Fullwiler, S. T. (2007). "Macroeconomic Stabilization through an Employer of Last Resort", Journal of Economic Issues, 41 (1), 93–134.

Fullwiler, S. T. (2013). "The Costs and Benefits of a Job Guarantee: Estimates from a Multicountry Econometric Model", in M. J. Murray and M. Forstater (eds.) The Job Guarantee: Toward True Full Employment. New York: Palgrave Macmillan, 73–94.

Godin, A. (2013). "Green Jobs for Full Employment, a Stock Flow Consistent Analysis", in M. J. Murray and M. Forstater (eds.) Employment Guarantee Schemes: Job Creation and Policy in Developing Countries and Emerging Markets. New York: Palgrave Macmillan, 7–46.

Godin, A. (2014). "Job Guarantee: A Structuralist Perspective", Revue de la régulation. Capitalisme, institutions, pouvoirs, 16.

Gregg, P., and Tominey, E. (2005). "The Wage Scar from Male Youth Unemployment", Labour Economics, 12 (4), 487–509.

Haim, D. (2021a). A Job Guarantee Proposal for Austria: Public Policy for Full Employment and the Reduction of Poverty and Inequality. Master's thesis, Levy Economics Institute of Bard College, Annandale-on-Hudson, NY. *https://digitalcommons.bard.edu/levy_ms/32/*

Haim, D. (2021b). "What Jobs Should a Public Job Guarantee Provide? Lessons from Hyman P. Minsky". Working Paper, No. 981, Levy Economics Institute of Bard College, Annandale-on-Hudson, NY.

Hausegger, T. and Krüse, T. (2019). Evaluation der Aktion 20.000. Endbericht im Auftrag des Bundesministeriums für Arbeit, Soziales, Gesundheit und Konsumentenschutz, Vienna.

Heinzle, M. (2020). Impact Analysis of a Job Guarantee for the Long-Term Unemployed in Austria. Master's thesis, Vienna University of Economics and Business.

Jahoda, M., Lazarsfeld, P. F. and Zeisel, H. (1975). Die Arbeitslosen von Marienthal. Ein soziographischer Versuch über die Wirkung langandauernder Arbeitslosigkeit. Mit einem Anhang zur Geschichte der Soziographie. Frankfurt am Main: Suhrkamp. First edition published by S. Hirtzel, Leipzig, in 1933.

Kasy, M. and Lehner, L. (2022). "Employing the unemployed of Marienthal: Evaluation of a guaranteed job program", CESifo Working Paper No. 10394.

Krug, G. and Eberl, A. (2018). "What Explains the Negative Effect of Unemployment on Health? An Analysis Accounting for Reverse Causality", Research in Social Stratification and Mobility, 55, 25–39.

Majewski, R. and Nell, E. J. (2000). "Maintaining Full Employment: Simulating an Employer of Last Resort Program". Seminar Paper, No. 6, Center for Full Employment and Price Stability (CFEPS), Kansas City.

Majewski, R. (2004). "Simulating an Employer of Last Resort Program", in G. Argyrous, M. Forstater and G. Mongiovi (eds.) Growth, Distribution, and Effective Demand: Alternatives to Economic Orthodoxy. New York/London: M.E. Sharpe, 163–180.

Mario, A. (2021). "Simulating an Employer of Last Resort Program for Argentina (2003–2015)", Journal of Post Keynesian Economics, 44 (2), 208–238.

Miller, R. E. and Blair, P. D. (2009). Input-Output Analysis: Foundations and Extensions. Cambridge: Cambridge University Press.

Minsky, H. P. (1968). "Effects of Shifts of Aggregate Demand upon Income Distribution", American Journal of Agricultural Economics, 50 (2), 328–339.

Mitchell, W. (2012). "The Costs of Unemployment – Again". Blog post. Available at: *https://billmitchell.org/blog/?p=17740* (Accessed: 16 May 2023).

Murray, M. J. (2012). "The Regional Benefits of the Employer of Last Resort Program", Review of Radical Political Economics, 44 (3), 327–336.

Murray, M. J. (2017). "Public Policy for Working People", in M. J. Murray and M. Forstater (eds.) The Job Guarantee and Modern Money Theory: Realizing Keynes's Labor Standard. New York: Palgrave Macmillan, 25–46.

Nüß, P. (2018). "Duration Dependence as an Unemployment Stigma: Evidence from a Field Experiment in Germany". Working Paper, No. 2018-06, Kiel University.

Papadimitriou, D. B. (2008). "Promoting Equality through an Employment of Last Resort Policy". Working Paper, No. 545, Levy Economics Institute of Bard College, Annandale-on-Hudson, NY.

Picek, O. (2020). "Eine Jobgarantie für Österreichs Langzeitarbeitslose", Momentum Quarterly – Zeitschrift für sozialen Fortschritt, 9 (2), 103–126.

Premrov, T., Geyer, L. and Prinz, N. (2022). "Arbeit für alle? Kosten und Verteilungswirkung einer Jobgarantie für Langzeitbeschäftigungslose in Österreich", Wirtschaft und Gesellschaft, 48 (1), 59–82.

Singh, G. K. and Siahpush, M. (2016). "Inequalities in US Life Expectancy by Area Unemployment Level, 1990–2010", Scientifica, 4, 1–12.
Statistics Austria (2020). Input-Output Table 2017. Available at: *https://www.statistik.at/statistiken/volkswirtschaft-und-oeffentliche-finanzen/volkswirtschaftliche-gesamtrechnungen/input-output-statistik* (Accessed: 1 July 2021).

Statistics Austria (2022). Poverty. Available at: *https://www.statistik.at/en/statistics/population-and-society/income-and-living-conditions/poverty* (Accessed: 21 July 2023).

Tamesberger, D. and Theurl, S. (2019). "Vorschlag für eine Jobgarantie für Langzeitarbeitslose in Österreich", Wirtschaft und Gesellschaft, 45 (4), 471–495.

Tamesberger, D. and Theurl, S. (2021). "Korrekturhinweis zu 'Jobgarantie für eine Jobgarantie für Langzeitarbeitslose in Österreich' im Ausgabe 45(4)", Wirtschaft und Gesellschaft, 47 (2), 294–294.

Tcherneva, P. R. (2019). "The Federal Job Guarantee: Prevention, Not Just a Cure", Challenge, 62 (4), 253–272.

Walch, D. and Dorofeenko, V. (2020). Untersuchung der fiskalischen Effekte der Beschäftigungsaktion 20.000. Endbericht im Auftrag des Bundesministeriums für Arbeit, Soziales, Gesundheit und Konsumentenschutz, Vienna.

Watts, M. and Mitchell, W. (2000). "The Costs of Unemployment in Australia", The Economic and Labour Relations Review, 11 (2), 180–197.

Wray, L. R. (1997). "Government as Employer of Last Resort: Full Employment without Inflation". Working Paper, No. 213, Levy Economics Institute of Bard College, Annandale-on-Hudson, NY.

Wray, L. R., Dantas, F., Fullwiler, S., Tcherneva, P. R. and Kelton, S. A. (2018). "Public Service Employment: A Path to Full Employment". Research Project Report, Levy Economics Institute of Bard College, Annandale-on-Hudson, NY.