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Macro-economic simulation of two policy scenarios in the Netherlands

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Key message

Technological change (automation, robotisation, AI) challenges labour markets and is likely to reduce industrial employment (cf. Levels, Somers, & Fregin, 2020) whereas it at the same time increases economic growth and therewith income. Both the decline in employment and growth in income are not evenly spread across the skill and income distribution. Unskilled workers and people with low income, such as those on welfare, are expected to bear the larger burden. The expected rising inequalities with a view to access to employment and income requires an innovative policy response based on scientific knowledge on the effects of viable policy scenarios. In this policy brief we first discuss the lessons learned from a review of macro-economic simulation studies of alternative policy scenarios such as Unconditional Basic Income (UBI), Negative Income Tax and Participation Income (PI) in a variety of countries (Somers, Muffels & Kuenn-Nelen. 2022). Then, we report on a macro-economic simulation study that is conducted on two alternative policy scenarios to deal with the rising inequalities. Two of such policy scenarios are now in debate in the Netherlands: a substantial (20 to 40%) rise of the minimum wage and a change in the welfare system in which more rewarding income incentives are built in by a more generous earnings disregard in the social welfare system. The latter scenario implies a reduction in the marginal tax rate for people on social assistance who start working or increase their working hours while being enrolled in welfare. The benefit withdrawal rate, that is actually reduced from 100% to 50%, acts as a work bonus for people who start working part-time. For people who find a full-time job for at least 27 hours a week at the minimum wage level[1], the basic social assistance benefit (1000 euros per month for a single person) is fully displaced by earnings and the marginal tax rate relief is further reduced from 50% to 100%. In this way the policy scenario has built in work incentives for people who start a part-time or full-time job. The rise in the minimum wage, the second scenario, raises the income of about 400 thousand people on a minimum wage, but also raises the labour costs for the employer which might lead firms to displace workers in favour of investing in automation. A rise in the minimum wage will therefore likely have a positive substitution effect on notably men's labour supply (wage increase) and a negative income effect on female labour supply notably for women with caring duties (exchanging working for caring time). The net effect is dependent on the behavioural effects of both partners in the household. The simulations we performed show to what extent there is a net positive or negative effect on employment and income while taking account of the autonomous effect of automation on economic growth and employment. The automation scenario reduces employment by 16% which is largely compensated in both scenarios by the effect of automation on economic growth and the net positive income effect of either the extra earnings disregard or the increase in the minimum wage. The findings are very similar to the findings in micro-macro simulation studies in other countries (Somers, Muffels & Kuenn-Nelen. 2022).

[1] The Social Assistance benefit level is linked to the level of the minimum wage and amounts to 70% of the minimum wage. This means that if people find employment for at least 70% of the normal working hours per week of 38 hours(27 hours) they exit the welfare scheme.

Mixed Evidence from Macro Simulation Studies in Various Countries

With a view to the employment effects studies of UBI and PI-based policy scenarios, mixed evidence is found from macro-economic or combined micro-economic and macro-economic simulation studies in the US and Canada as well as in Europe (cf Somers et al. 2021). The effects on income and on reducing poverty and inequality are more consistent, substantial and mostly positive although the effects are dependent on the reform scenario, the methodology and the empirical model used. In UBI scenarios people might reduce their earnings due to the increased marginal tax rates to fund the UBI scheme. In such a scenario the employment effects might be negative and offsetting the positive poverty reducing impact. In NIT or PI scenarios marginal tax rates and hence labour supply responses might be positive because of reduced claw-back rates (benefit withdrawal rate) creating extra work incentives. With respect to methodology, most simulation studies use a static macro-economic framework, without taking behavioural labour supply effects into account. The labour supply effects might be either smaller or larger negative when behavioural effects are included. They are larger negative when men and women reduce their labour supply either because of the increased marginal tax rate needed to fund the UBI or because notably women with children reduce their labour supply as a consequence of the extra income they receive from the guaranteed minimum income scheme. They are smaller negative, insignificant or even positive in experiment and simulation studies of a negative income tax or a tax allowance (such as in the extra earnings disregard scenario in the Netherlands). The reason is that in these scenarios the marginal tax rate at lower income declines resulting in higher wages and hence increased labour supply and income and reduced poverty. Workfare or conditional income support programmes on the other hand seem to reduce work incentives because of the 100% marginal tax rate for benefit recipients. This might explain why in the Dutch earnings disregard scenario the negative employment effects of automation are largely offset by the positive employment effects of the extra work bonus. Further, it is shown that richer labour supply models viewing family instead of individual labour supply responses and including social welfare effects associated with lower levels of inequality and increased time for caring yield smaller negative or even positive employment effects, notably of NIT and conditional basic income and PI schemes. A Spanish simulation study on a conditional basic Income reform using a family labour supply and social welfare framework did not find any negative labour supply effects (Labeaga et al. 2019). It appears that the social welfare gains of a higher minimum income compensate the efficiency or employment losses of a higher tax rate. One might conclude that a NIT and conditional basic income such as a Participation Income scheme perform better than an UBI with respect to income and employment. In that perspective the results found in our macro-simulation study on the Dutch scenario are rather similar to the ones found in other countries. Studies on the employment effects of the minimum wage reform in the UK in the late 1990s show in most studies small but mixed employment effects. Interestingly, one UK micro-macro simulation study on Participation Income in the UK in 2017 (Atkinson et al. 2017), also looked at the impact of a minimum wage reform alone or combined with a PI reform for reducing inequality and poverty. Whereas the impact of the PI reform on reducing inequality and poverty is substantial, the impact of the minimum wage reform on inequality and poverty appeared to be modest (less than 0.5pp). The reason is that low wages are spread over a large part of the household income distribution and that part of the income gain due to raising the minimum wage is withdrawn from the means-tested minimum benefits. A Dutch study assessed the effects of two technology-change related policy scenarios: a 40% capital tax that is redistributed to wage earners in the form of an unconditional basic income (UBI) and a 10% savings rate on wages that is fully reinvested in robot technology (robotisation, machine learning, artificial intelligence) and which may create perpetual growth but with low wage income shares. Perpetual growth is a state of advanced technology as embodied in capital goods in which there is growth of per capita income without technological progress anymore. According to such a technology scenario, future levels of income inequality will, without social policy reforms, rise unprecedently according to the authors because labour is hardly needed for production anymore. Using a static and a behavioural labour supply simulation model, the findings show that the wage-savings robot-investment scenario produced better inequality reducing results than the UBI-capital tax scenario (Normaler & Verspagen, 2020). In such technology-driven scenarios where adverse employment effects are forecasted, innovative policy approaches and reforms are needed to counteract the social inequalities evolving from them.

Small increase in disposable income has high social impact[2]

Change in welfare regime

The greatest policy challenge lies in designing income schemes to help displaced workers by automation. The future employment trends assume the displacement of workers by automation in line with the scenario assuming low automation risk, full adoption by 2035, and employment protection from Heald et al. (2019). In this context, we explore the socio-economic impact of an income scheme called earnings disregard regime in in which people get a work bonus when they start to work or work more hours. Table 1 presents the assumptions we have used in the macroeconomic simulation.

Positive economic outcomes are observed. Our results suggest that impact on GDP is positive and increasing over time, reaching between 0.4 and 1% compared to the baseline in 2030, depending on how the policy is financed. Financing of the additional public spending through VAT increase means higher prices which has a different impact as opposed to higher income taxes (which is another method of financing the additional public spending we have used).

The negative impact of automation on employment is slightly offset by an increase in employment driven by increase in disposable income. An increase in income (and not in wealth) increases labour supply[3] and demand for goods and services in the economy which in turns boosts employment demand. Figure 1 shows that this income regime reduces the negative impact of automation on employment.

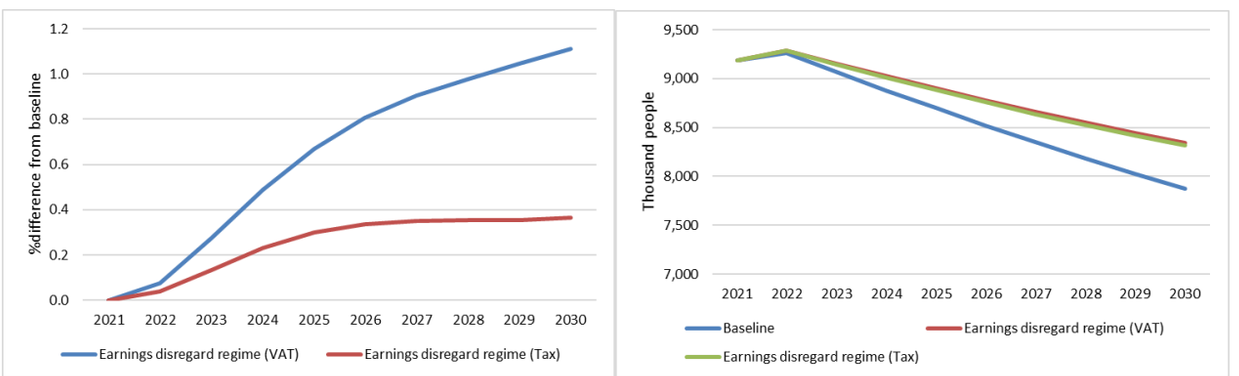
Table 1: Scenario assumptions

Scenario	Scenario assumptions
Baseline	16% of jobs in the Netherlands to be displaced by automation over 2021-30.
Earnings disregard regime	Among the 16% displaced by automation, 14% of them manage to re-enter into full-time or part-time employment. The rest will enter into social assistance in which people get a work bonus when they start to work or work more hours. In each year, 15% of people on social assistance may keep 50% of the earnings from part-time work up to the maximum of 203 euros per month. When they find full-time work they exit Social Assistance and keep 100% of their earnings. Financing the social assistance: 1. VAT increase; or 2. Income tax increase

Source: Suta et al. (2021)

Sectors are impacted differently. Our modelling assumed a re-instalment effect on employment from the increased demand for goods and services.

Figure 1:NL GDP and employment – scenario results



[2] These computations are based on: Suta, C.M., Alexandri, E, Barbieri, L., Summerton, P. & Muffels, R.J. (2021). Modelling assessment of income schemes. Technequality Working Paper (Deliverable D4.4). [LINK]

[3] There is an income and substitution effect of earnings disregard on labour supply. The lowered marginal tax rate on earnings (reduced withdrawal rate of benefits from 100 to 50%) increase labour supply and therewith the income. The extra income might increase the labour supply of men and decrease the labour supply of women notably for women with caring duties for relatives or children (cf. Muffels et al. 2021). The simulations suggest that there is a net positive effect on employment reducing the negative effect of automation on employment.

30% increase in minimum wage

All workers should benefit from an adequate minimum wage. The current EU level debate is how to ensure that wages are fair in relation to wage distribution in the country and that they provide a decent standard of living. In the Netherlands, the social partners are calling for an increase of 20% to 40% (30% on average) in the minimum wage to raise the standard of living of 372 thousand workers with a minimum wage. *Table 2* presents the assumption for macro-economic scenario for the Netherlands.

Positive economic impact is expected from the implementation of this increase in minimum wage. Our quantitative analysis suggests that a 30% increase in minimum wage would have positive economic impact on the economy compared to the baseline. The increase in demand caused by higher wages more than offsets the negative effects caused by a small reduction in employment due to higher prices, with GDP reaching a peak difference from the baseline of 0.16% in 2023, before gradually declining to 0.11% in 2030.

Table 2: Scenario assumptions

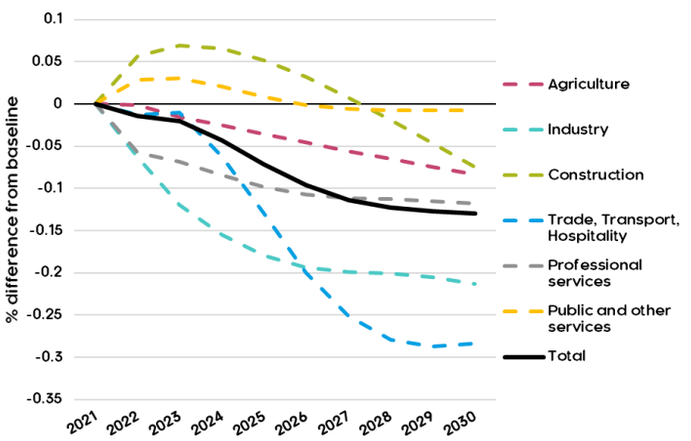
Scenario	Scenario assumptions
Baseline	16% of jobs in the Netherlands to be displaced by automation over 2021-30.
30% increase in minimum wage	30% increase in minimum wage in NL Share of workers on minimum wage in each sector* affects the change in wage bill in the sector. No changes in minimum wage of other EU MS

* Using the shares of workers on minimum wage by sector from EC impact assessment[4].

Negligible employment loss to increase the income of 372 thousand workers. The current employment projections (the baseline) assume a 16% decline in employment by 2030 due to automation. The impact of the increase in minimum wage will bring additional 10 thousand jobs being lost by 2030 (-0.1% compared to baseline).

The increase in labour costs affects economic sectors differently. With regard to employment, sectors with more minimum wage workers such as industry, and trade, transport and hospitality will also be the most impacted by the rise in labour costs. In the public and other services sector, the decision to keep the same number of employees is not affected by wages but by the need to satisfy the demand for public services.

Figure 2: NL employment by sector (% difference from baseline)



Recommendations for policy responses

- **NIT and PI schemes perform best with respect to maintaining employment compared to UBI schemes**. The reason is that the NIT-PI schemes yield lower marginal tax rates and hence, stronger work incentives. For the same reason, the 16% reduction in employment in the baseline automation scenario for the Netherlands is largely compensated by the positive employment effects of the earnings disregard scenario in which people on welfare face lower marginal tax rates while getting an extra work bonus.
- **Policy measures tested, such as increasing the minimum wage, can reduce the inequality brought about by automation and AI with very small macroeconomic consequences**. In automation scenarios adverse employment effects are forecasted asking for innovative welfare state policy approaches and reforms to counteract the social inequalities with respect to employment and income evolving from them. Reforms such as increasing the minimum wage to reduce the inequality as a consequence of automation will exert a small displacement effect on employment but is likely to increase income notably for low-income people and therewith reduce poverty and inequality.

[4] European Commission (2020a) *Commission staff working document impact assessment accompanying the document Proposal for a Directive of the European Parliament and of the Council on adequate minimum wages in the European Union*. Available at: https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SWD:2020:0245:FIN:EN:PDF.

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