

# Human Capital Mismatch in the Labour Market

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# Valorisation Addendum

## Valorisation addendum

Matching the skill supply to the demand for skills in the labour market is of utmost importance for workers, firms, and the economy in general. A situation in which the match between the supply and demand for labour does not come about well is also referred to as skill mismatch. A poor match between workers and jobs is often associated with undesirable outcomes. Mismatched workers generally incur a wage penalty, are less satisfied with their jobs, experience more health issues, and face an increased risk of long unemployment spells. From a societal perspective, the development of human capital can be considered an expensive outlay that is made through public investment in education and training. Skill mismatch can result in lower returns on public investment, not only in the form of foregone tax revenues but also in terms of increased spending on unemployment allowances. The highest return on human capital investments is realised when workers are properly matched to jobs, such that the skills acquired through education and on-the-job training can be optimally utilized in the labour market. Matching skills to jobs is gaining importance in the context of increased global competition, accelerated pace of technological change, and changes in the qualification level of the labour force. With this dissertation, I seek to provide insight into the extent to which skill mismatch is present in the labour market – in particular the Dutch labour market – and what policy measures can be deployed to prevent mismatch. Moreover, I aim to shed light on how the demand for skills is changing. The findings of this dissertation are particularly valuable in shaping education and training policies and in aiding individuals in making human capital investment decisions.

In *Chapter 3*, I examine how the pervasiveness of skill mismatch in the Dutch labour market has developed over the past decades from the perspective of employers. Specifically, I examine to what extent firms face *skill gaps* by exploiting survey data on whether their workforces are equipped to perform their job tasks in the coming years. I document how the incidence of skill mismatch has developed over the period 1991-2011 and whether the observed trend can be explained by the educational upgrading of the Dutch workforce. During this period, the educational attainment of the workforce increased at all levels. The educational expansion coincided with a significant increase in public investments in education. While an extensive literature exists on the education expansion and its implications for workers, it remains unclear whether firms have benefitted from the increased educational attainment of the labour force. I illustrate that in 1991, almost half of the Dutch employers reported that their workforce is not sufficiently equipped to perform the job tasks, while in 2011, only a quarter of the employers reported skill mismatch. The educational upgrading of the labour force significantly contributed to this declining mismatch trend.

Given that the Dutch higher education premium has continued to increase since the early nineties, our results suggest that the supply of higher skilled graduates has responded positively to the increasing demand for skilled labour. Nevertheless, the findings of *Chapter 3* do not imply that policies should simply be geared toward increasing the educational attainment of the labour force. Despite the increasing college premium, there is ample evidence that the educational expansion has forced many job seekers to accept jobs below their level of education. These developments indicate that the premium on higher education is not incurred by every college or university graduate. In fact, the labour market returns across college majors are heterogeneous. Moreover, the wage dispersion among workers with similar levels of schooling has increased in recent decades, at least in other developed economies. This informs us that the type of skills that students acquire through formal education – in addition to the level of skills – is becoming increasingly important in determining graduates' labour market success. In fact, in *Chapter 2*, I illustrate that the consequences of a job-education mismatch is more pronounced in situations in which workers' field-specific skills are underutilised. For example, graduates who predominantly acquired occupation-specific skills suffer from larger wage penalties when they end up in a job that is unrelated to their field-of-study than workers who mainly possess general skills that can be applied in a wider variety of jobs.

The increasing importance of acquiring specific type of skills – rather than just investing in additional years of schooling – is also illustrated well in *Chapter 6*. In this chapter, I examine how different types of skills are rewarded in the Dutch labour market and how this has changed over the past two decades. Specifically, I investigate how the labour market reward for non-routine skills have changed between 2001 and 2016. I document that the return to analytical skills has substantially increased over this period of time. This not only holds true for workers in the upper-end of the wage distribution, but also for workers in the middle- and lower-end of the distribution. A potential explanation for this findings is that the demand for non-routine tasks (i.e. interpreting and analysing information) has increased as computerization has improved the productivity and lowered the price of tasks (i.e. retrieving and manipulating information) that typically complement non-routine tasks. While certain tasks in many middle-skill occupations are susceptible to automation, the increasing return for non-routine tasks across all segments of the wage distribution points out that many jobs will continue to require a changing set of skills. Hence, encouraging the development of analytical skills will not only continue to be essential in higher education, but also in other segments of the education system.

In *Chapter 4*, I investigate whether a five-day study choice intervention that is offered to 16-year olds can motivate students in pre-vocational education (pre-VET or in Dutch:

vmbo) to choose for a Science, Technology, Engineering and Mathematics (STEM) programme in upper-secondary vocational education and training (VET or in Dutch: mbo). The demand for VET graduates with a STEM degree is increasing in the Dutch labour market and is expected to grow further in the future. Despite the rising demand for STEM workers, the share of VET graduates with a STEM degree has declined in recent years. This chapter aims to shed light on how *skill shortages* can be prevented in the Dutch labour market. STEM education in VET prepares students for a wide range of occupations (e.g. construction workers, electricians, mechanical technicians, maintenance and repair workers) and constitutes an important supply source for STEM-related skills. By letting students engage in hands-on activities, the five-day intervention introduced pre-VET students to a number of STEM occupations. In addition, participating students were informed about the labour market perspectives of each of these education programmes.

While the intervention did not increase STEM enrolment among native Dutch students, it did have a small positive effect on immigrant background students. The latter group tends to be less confident about its ability to successfully complete a STEM programme, is on average less well-informed about the labour market perspectives of different schooling paths, and has more negative associations with STEM jobs due to the low status in the country of origin (e.g. construction work). Hence, the information deficiency regarding students own ability, preferences, and the labour market is likely to be greater for immigrant students. Consequently, the potential of the intervention to reduce this information gap was greater for immigrant students. The intervention most likely only had a small to no effect due to the selective sample of participants. The majority of students participating in the intervention already showed a clear interest in a STEM career and most likely would have enrolled in a STEM programme even in absence of the intervention. Provided that pre-VET students are already tracked into different sectors (e.g. health, agriculture or STEM) at the age of 14, students should be targeted by STEM interventions at an earlier stage in their educational trajectory. Moreover, prior research has shown that many graduates with a STEM degree still end up in unrelated jobs. As such, future policy interventions should not only encourage students to choose for STEM education, but actually ensure that graduates exploit their STEM skills in the labour market. More research is needed to show how this can be achieved.

In *Chapter 5*, I explore how the quality of educational choices can be improved to prevent skill mismatch. In the Netherlands, there is growing attention for the development of relevant indicators of current and future field-specific labour demand to guide students in their schooling and occupation choices. Such forecasts are particularly relevant for vocational programmes as these tracks are more sensitive to fluctuations in the labour

market. Given that I cannot directly test whether increasing the availability of labour market information affects youngsters' field-of-study choice, I examine how unanticipated changes in labour market conditions are related to the quality of educational choices. The quality of schooling choices is measured by whether graduates experience regret in their field-of-study choice upon labour market entry. The findings of my study indicate that graduates are more likely to regret their field-of-study choice when they experience unfavourable changes in labour market conditions. This relationship is only observed for male graduates which could be explained by the fact that males and females form their education choices on different grounds, males attaching more weight to pecuniary aspects of their future job than do females. Another potential reason for this gender difference is that females sort into fields (e.g. healthcare) that are more stable across business cycles. From a policy perspective, the findings suggest that prospective VET students could benefit from improved availability of accurate labour market forecasts by field-of-study. Although improving the availability of labour market information is a necessary condition to improve students' educational choices, it remains unclear whether providing students with information alone is sufficient to affect their behaviour. Hence, policy makers should focus attention on helping students to digest and incorporate labour market information into their decision-making process.