The Dual VET Share Dataset, 1996 - 2020

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Please cite Emmenegger and Haslberger (2025) when using the dataset!

This document details how we created the dataset of dual VET shares at upper secondary level, which covers the period from 1996 - 2020. The dataset covers the following countries: AU, AT, BE, CA, CL, CZ, DK, EE, FI, FR, DE, GR, HU, IS, IE, IL, IT, JP, KR, LV, LT, LU, MX, NL, NZ, NO, PL, PT, RU, SK, SI, ES, SE, CH, TR, GB, US. We apply the OECD definition which considers *combined school- and work-based programmes* those in which "less than 75 per cent of the curriculum is presented in the school environment or through distance education. Programmes that are more than 90 per cent work-based are excluded" (OECD, 2001, 401). We obtain the shares by dividing enrolment in dual VET programmes at upper secondary level by total enrolment at upper secondary level.

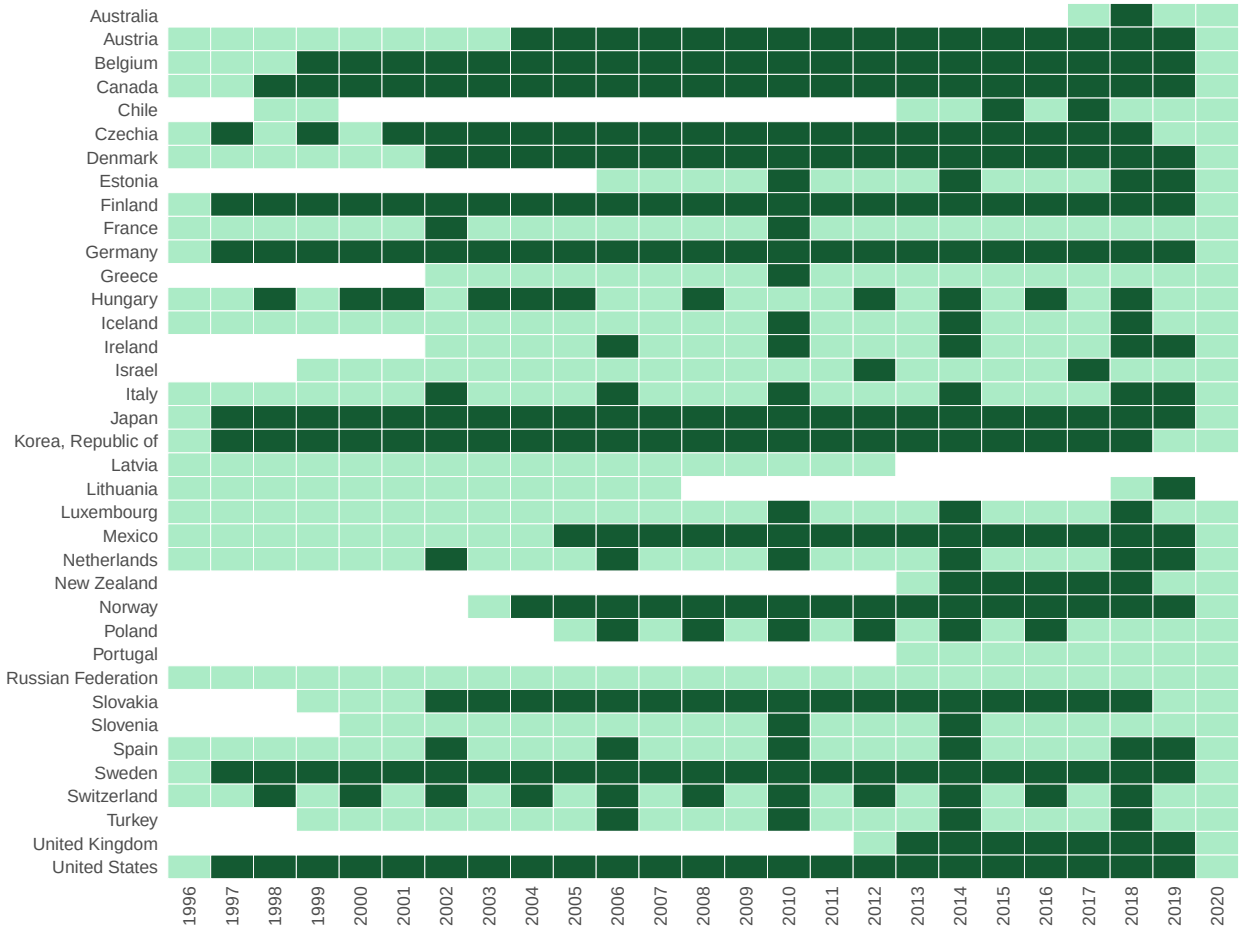
We first collected all dual VET share data from the OECD *Education at a Glance* reports (1998, 2000 - 2012). For the period 2013 - 2020, we relied on data from the OECD.stat database. This basic dataset covers 448 of the 925 country-years. However, the OECD data contain many missing observations and various missingness codes that are unsuitable for quantitative analysis. Hence, we consulted the Cedefop and Eurydice websites to verify the nature of the country's VET system. Based on the information gathered, we searched national databases and contacted national statistical offices or education authorities to obtain enrolment data (with varying success). This allowed us to add an additional 84 country-years with dual VET shares greater than zero. We furthermore coded the dual VET share in country-years where no organised form of dual VET existed as "0", replacing missing observations or missingness codes in the OECD data. This applies to 220 country-years. In 64 country-years, we furthermore updated or corrected the data provided by the OECD. To fill gaps of one or two years in the time series, we used linear interpolation (24 country-years). In total, we are thus able to provide data for 768 of the 925 country-years in the dataset. In the following, we describe the process for each country in the sample. The data are available on Harvard Dataverse (see here).

Figure 1 provides an overview of the coverage of our dataset. It also shows that, despite the fairly comprehensive coverage (light green), missing covariates—especially wage data—reduce the number of observations included in the models in Emmenegger and Haslberger (2025) (dark green). Figure 2 plots the evolution of dual VET shares by country. Excluding countries where large jumps occur (Slovakia and Hungary) does not change the results, see Table B4 in Emmenegger and Haslberger (2025).

Austria, Belgium, Denmark, Finland, France, Germany, Iceland, Luxembourg

A complete and consistent time series is provided by the OECD.

Figure 1: Coverage of the dual VET share dataset



Note: The figure shows the coverage of our dual VET share dataset. Dark green country-years are included in the main models in Emmenegger and Haslberger (2025). Light green country-years are included in the dataset, but not in the estimations in the paper due to missing covariates.

Italy, Japan, South Korea, Mexico, Russia, United States

No organized form of dual VET exists in the country. Hence, we code it as "0" throughout.

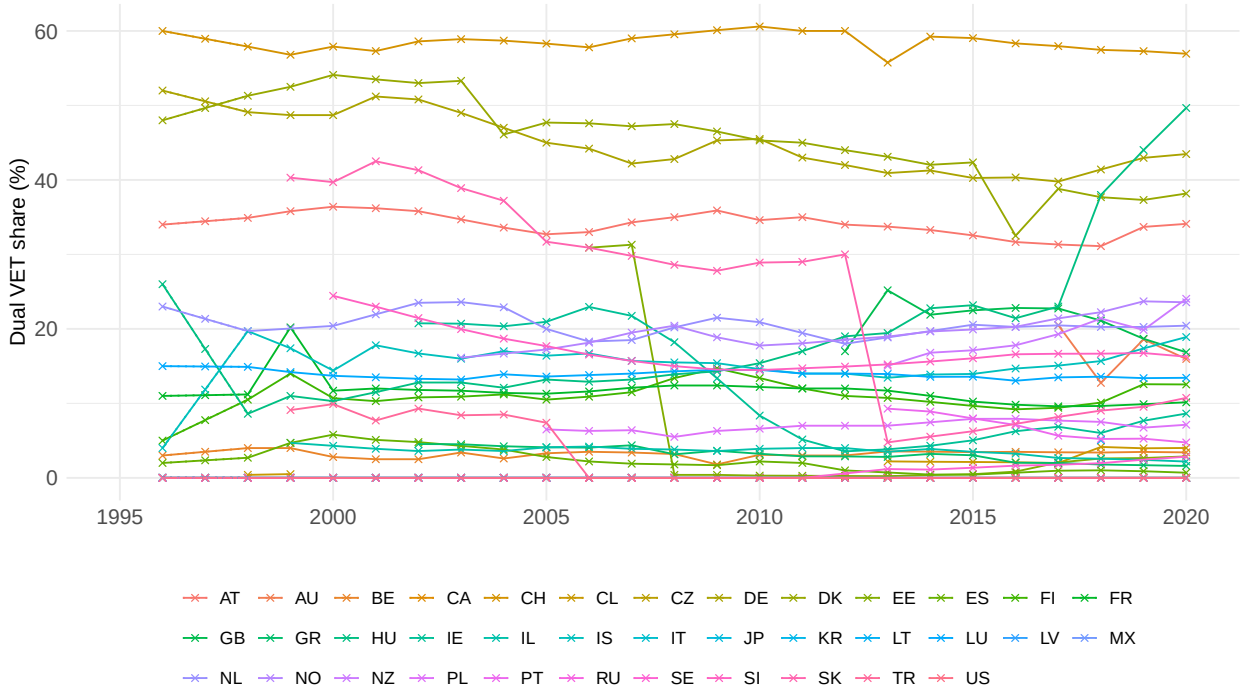
Australia

The OECD provides data for the years 2017 to 2020. We could not retrieve additional data for dual VET at upper secondary level for Australia from national sources.

Canada

No organised form of dual VET exists in Canada, although there are Youth Apprenticeship Initiatives at sub-national level. Yet, these initiatives seem to be a marginal phenomenon. Hence, we code Canada as "0" throughout.

Figure 2: Evolution of dual VET shares



Chile

The OECD provides data on Chile for the years 1998/1999 and the period 2013-2020. We could not retrieve additional data for dual VET at upper secondary level for Chile from national sources.

Czech Republic

For the Czech Republic, the OECD offers a time-series from 1996 to 2016. However, there is strong variation over time, in particular from 2012 to 2013. However, according to Cedefop, Czech apprenticeships are typically school-based VET. There is also an additional, less demanding educational track at upper secondary level. However, Cedefop argues that also these tracks "cannot be considered as apprenticeships" because VET schools are solely responsible for organising the practical part of the training, and even where employers are in fact involved, students do not have a formal contract with employers. Hence, we code the Czech Republic as "0" throughout, replacing the OECD data.

Estonia

The OECD provides data on Estonia for the periods 2006-2010 and 2013-2020. We have interpolated the values for 2011 and 2012. The value drops from 2007 to 2008 and then begins a slow recovery.

Greece

The OECD data only contain the values for 2013 and 2014. We calculated our own time series of dual VET shares for 2002 - 2020 using information on the number of apprentices provided by Cedefop and data on upper secondary enrollment provided by the OECD (2013-2020) and the World Bank (2002-2012). Enrollment data for the years 2008/09 were interpolated.

Hungary

A complete time series is provided by the OECD. The recent jump in dual VET enrolment is due to a larger share of VET being classified as work-based following reforms that increased the amount of training in companies.

Ireland

The OECD provides a handful of observations that vary widely and are rather implausible (such as a jump from 10% to 36% from 2017 to 2018). We therefore create our own time series (2002 - 2020) based on OECD data on total enrolment in upper secondary education and enrolment in apprenticeships. The dynamics of the resulting time series correspond to qualitative descriptions of the Irish dual VET system (implosion around the Financial Crisis and subsequent recovery).

Israel

The OECD provides data for the years 1999 and 2001 to 2020. We have interpolated the value for 2000.

Latvia

In Latvia, apprenticeship programmes were introduced in 2015 (with some pilots since 2013). The apprenticeship scheme is available for all VET programmes at EQF levels 2 to 4. Previously, VET was school-based but also heavy on WBL (see Cedefop). However, despite several requests, we were unable to procure enrolment data for the apprenticeship scheme from the Latvian Statistics Office, only overall VET and upper secondary enrolment from Eurostat.

The OECD provides data from 2013 onwards, but the 40% in OECD Stat are highly questionable. They appear to count all VET (including school-based WBL) as dual VET (see also Eurostat), going back to 2010 and 2005 (before the apprenticeship scheme was introduced). This may be justified given the high share of WBL, but it would deviate from our coding practice in the other countries and the definition in the OECD reports where practical instruction has to take place outside the school to be considered work-based VET. For this reason, we code the period before the introduction of the apprenticeship scheme as "0" and recode the subsequent period to missing until we can find reliable data.

Lithuania

The OECD collects enrolment data for Lithuania only since 2013, but the dual VET share is missing even then. An apprenticeship scheme was introduced in 2008; before then, all VET programmes were school-based, albeit with a heavy dose of WBL (see Cedefop). The Statistical Office does not provide statistics that distinguish between different types of VET, only overall VET and overall upper secondary. The situation is thus similar to Latvia. Cedefop lists the number of apprentices in 2018, which amounts to 5% of all upper

secondary pupils. The Period before the introduction of the apprenticeship scheme is coded as "0" and the subsequent period as missing, with the exception of 2018.

Netherlands

Except for a few years which we interpolate (1999, 2001, 2011), the OECD provides a complete time series from 1996 to 2012 based on Eurostat data. Later, dual VET enrolment is no longer recorded separately by Eurostat, only total upper secondary VET (available 2015 - 2020). Hence, we can only fill the series if we make an assumption about the share of dual VET of all upper secondary VET in 2015 – 2020. We can either assume it has remained approximately the same as in 2005 (29.5%) and 2010 (31.1%) or extrapolate the trend. Data from the ministry show that the share of (dual) BBL students has risen compared to (school-based) BOL students over the 2014 – 2021 time frame, albeit from a lower baseline. We therefore opt for the conservative approach and assume that a constant share of 30% of upper secondary VET students are in dual programmes. This results in a continuation of the trendless fluctuation of the time series that is observed in the OECD data until 2012.

New Zealand

The VET system in New Zealand is organised somewhat differently than in European countries, with various different qualification levels that can be reached either through workplace-based industry training (including traineeships and apprenticeships) or through provider-based establishments (VET schools). Most importantly, New Zealand classifies VET as tertiary education. Hence, while we found data on the total number of apprentices and on total upper secondary enrolment, we are not 100% certain that this is the correct denominator. Still, we include the data for 2013 – 2020 for the time being (apprenticeship data are available from 2001, so the series can probably be extended). The other remaining question is whether trainees should also be classified as undergoing work-based VET. The data documentation states that "Trainees are non-apprentice industry training learners. Their main programme with an organisation does not meet the New Zealand Apprenticeships level and credit criteria". Including them would take the total dual VET share based on current calculations to approximately 60%, which seems unrealistically high. There is, furthermore, a large share of older learners among the trainees (more than 6 out of 10 are 30 years or older), while only 2 out of 7 apprentices are over 30 years old. This also suggests that it is appropriate to focus on apprentices for the dual VET share of upper secondary education (possibly even with an age cut-off), or use an age cut-off when combining trainees and apprentices.

Norway

In Norway, most vocational programmes are structured as 2+2: 2 years in school with 20% - 35% WBL which may take place in-school or in-company, followed by 2 years of fully workplace-based training. The system has been in place in more or less the present form since at least 1994 (Cedefop). Instead of the OECD enrolment data which show a gradual increase from 13% in 2005 to 17% in 2016 and then a sudden, unexplained jump to 35% in 2017, we use data on apprentices (2003 – 2020) and total upper secondary pupils (2001 – 2020) directly from Statistics Norway. These data show a more gradual increase from 16% in 2003 to 24% in 2020.

Poland

An almost complete time series is provided by the OECD from 2005 to 2020, with the value for 2014 interpolated.

Portugal

For the entire period, the OECD reports various missing value codes for Portugal. However, a number of different VET pathways exist. In most, WBL is rather limited and provided in school. Apprenticeship programmes which are aimed at young people aged up to 25 and include 40% in-company WBL also exist since 1984, according to Cedefop. Furthermore, between 2013 and 2016 existed the short-lived *cursos vocacionais* which can also be considered a form of dual VET. Data are available in the annual statistical reports of the Ministry of Education from 2013 onwards. We are unable to calculate the dual VET share for the earlier period.

Slovak Republic

A complete time series is provided by the OECD for the period 1999 - 2020. The dual VET share shows a marked drop from 2012 to 2013, after which it starts to increase again. This likely reflects a change in the classification of programmes as work-based by the OECD.

Slovenia

The OECD reports provide data for a handful of years from 2006 onwards, but most years are coded as "magnitude is either negligible or zero" or "missing value; data cannot exist". According to Cedefop, there are different types of upper secondary VET with variable shares of work-based training. Whether programmes are considered work-based or school-based depends on the treatment of work-based learning in the school context. SPI and NPI entail at least 35% WBL. Both are mostly offered as a school-based path, but SPI also has an apprenticeship path. However, even the school-based paths involve a significant portion of in-company training. In school-based SPI, 60% of the 40% WBL are in-company (total 24%). In NPI, 20% of the 35% - 40% WBL are in-company (total 7% - 8%). In apprenticeship SPI, 90% of the 60% WBL are in-company (total 54%).

Data differentiating between school-based and apprenticeship SPI are not available. However, even school-based SPI devotes almost a quarter of instruction time to in-company training. We therefore use the share of all upper secondary students who are enrolled in SPI as the measure of dual VET. Data are available from the Slovenian Statistical Office for the period 2000 – 2020. The share of SPI has declined from 24% to 16% during this period. The data conflict with the OECD data in the few years where the OECD has provided data, but we believe that ours is the more appropriate reading of the Slovenian VET system.

Spain

An almost complete time series is provided by the OECD, with the value for 2013 interpolated.

Sweden

The apprenticeship-based version of VET was only introduced in 2011 (see Cedefop); until then, the dual VET share is zero. The OECD provides enrolment data from 2013, we interpolate the value for 2012.

Switzerland

An almost complete time series provided by the OECD, with the missing value for 2008 interpolated.

Turkey

The OECD reports dual VET shares between 7 and 10% from 1999 until 2005. Afterwards, the OECD reports that the "magnitude is either negligible or zero". According to Eurydice, Turkish VET may involve internships but not workplace training in the proper sense. Hence, we code the dual VET share as "0" from 2006 onwards.

United Kingdom

Consistent OECD data available 2012 - 2020. No older data found.

References

Emmenegger, Patrick and Matthias Haslberger. 2025. "Yesterday's Model for Tomorrow's Economy? Dual VET and Wage Inequality in the Knowledge Economy." Journal of European Social Policy .

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