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tackling undeclared work

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Estimating undeclared work in Denmark using the Labour Input Method (LIM)

Denmark

Summary

The Danish Tax Agency has applied the Labour Input Method (LIM) to Danish Labour Force Survey data and Danish tax data to estimate the prevalence and value of undeclared work.[i] The application uses individual-level data which means that the estimates can potentially be further broken down for operational use by administrations in various sectors and strategic planning purposes.

Title of the practice in original language	*Estimering af omfanget af sort arbejde i Danmark ved hjælp af Labour Input-metoden med data fra Arbejdskraftundersøgelsen (AKU) og skattedata på individniveau*
Name(s) of authorities/bodies/ organisations involved	▶ Danish Tax Agency (*Skattestyrelsen*)
Sectors	All
Target groups	▶ Danish Tax Agency inspectors and auditors (directly targeted); ▶ Employers and workers engaged in undeclared work (indirectly targeted).
Purpose of measure	Deterrence: improve detection

Aims and objectives

Application of the LIM enables the Danish Tax Authority to estimate accurately the prevalence and value of (including tax revenue lost from) undeclared work. This includes being able to dissect the results e.g. by sector or profession, so that they can inform the prioritisation of resources for audit activities or the targeting of informational campaigns and taxpayer communications.

Background context	▶ The Danish Tax Agency has previously been reliant on external sources for estimates concerning undeclared work. The application of the LIM in Denmark was developed to reduce reliance on external research institutes and to increase both the frequency of the production of estimates and autonomy with regards to the level of detail with which the results could be analysed;

	▶ The LIM requires the use of individual-level Danish Labour Force Survey data (from the Danish Statistics Office), to be analysed together with tax data; ▶ The Danish Tax Agency commenced its work to apply the LIM to Danish data in 2017, and the first application to 2014 and 2015 data was concluded in 2023. Preparations to update estimates for the period 2016-2023 are ongoing.
Key objectives of the measure	**General Objectives:** ▶ To improve the measurement of undeclared work by developing a more reliable and frequent method to estimate undeclared work in Denmark; ▶ To enhance data utilisation by using individual-level data from the Danish Labour Force Survey and Danish tax data (eIncome)ii for more accurate estimates. **Specific Objectives:** ▶ To replace the previous method used, which involved the transition from reliance on external surveys (e.g. Rockwool Foundation Research Unit) to the LIM; ▶ To increase frequency of estimates by enabling more frequent updates of undeclared work estimates using quarterly and annual data; ▶ To address data shortcomings, correcting issues such as missing data, overtime, extreme values, and errors in administrative data by using individual-level data; ▶ To enable sector-specific analysis by providing detailed estimates of undeclared work by sector and skill level (e.g. highly skilled vs others).

Main activities	The main activities involved include the following:
	▶ Data Collection
	  - Acquiring anonymized quarterly Danish Labour Force Survey data from Statistics Denmark;
	  - Acquiring anonymised tax data from Statistics Data.
	▶ Data processing
	  - Cleaning data;
	  - Aggregating tax data per quarter;
	  - Merging data from Danish Labour Force Survey and tax data.
	▶ Analysis
	  - Calculating discrepancies between self-reported actual working hours in Danish Labour Force Survey and working hours in tax data;
	  - Correcting data to address missing data, overtime, extreme values and errors;
	  - Estimating the prevalence and value of undeclared work by weighting respondents in the Danish Labour Survey and the

	value of their working hour discrepancies with sample weights from the Danish Labour Force Survey; - Disaggregating results e.g. by sector, skill level, age group. ▶ Reporting and updates - Presenting findings to relevant parties within the administration; - Updating estimates with new data.
Funding/organisational resources	The work is funded by the Danish Tax Agency. The cost of acquiring the necessary data from Statistics Denmark (approximately EUR 6 700 (DKK 50 000) for 2014 and 2015 data) is covered with budget funds from the Compliance Analysis Unit (national funds), which also houses the analysts working on the LIM.

	Outcomes The Danish Tax Agency used individual-level data from the Danish Labour Force Survey and tax records to estimate undeclared work, revealing significant proportions of undeclared hours among wage earners. Key lessons included the importance of data quality and methodological rigor, with frequent updates enhancing the operational value of the estimates.
Achievement of objectives	▶ In general, the LIM achieved the objectives of being more reliant than previous methods. While some work still needs to be done around the frequency of the estimates, a lot of progress has been made overall; ▶ The Danish Tax Agency has more autonomy with regards to the level of analysis applied to the data for operational use, but 2014 and 2015 estimates have become outdated in the meantime, so relevant parties in the administration are awaiting updated estimates; ▶ A study based on 2014 and 2015 data was carried out estimating the proportion of wage earners engaged in undeclared work, distinguishing between highly skilled and other workers.iii The results for those engaged in undeclared work were as follows; - Highly skilled workers: approximately 13 % in 2014 and 14 % in 2015; - Other workers: approximately 15 % in 2014 and 16 % in 2015.
Lessons learnt and success factors	▶ It is important that household surveys (e.g. Labour Force Survey) are conducted by an organisation not associated with the tax administration e.g. statistics office, so that respondents have no fear of repercussions from truthful answers;

	Culturally in Denmark there is high levels of trust in public organisations and therefore answers about actual working hours in the survey are regarded as reliable.
Transferability	The LIM shows significant potential for transferability to other countries provided that their tax data are highly accurate and can be matched with the national input to the EU Labour Force Survey.

Further information	
Contact	Annie Wan Sun, Compliance Analysis, Danish Tax Agency, E-mail: Annie.Sun@sktst.dk
Useful sources and resources	**Danish Tax Agency weblink:** https://skat.dk/en-us/about-us/about-us

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[i] *According to an article by Søndergaard (2023), the labour input method measures the difference between the working hours reported in official employment or tax records and the hours respondents report in the Labour Force Survey. The difference is assumed to be undeclared working hours. The method relies on the assumption that respondents have no reason to hide their undeclared hours in a household or labour force survey. Therefore, it is essential that the survey is carried out by an institution not linked to the tax authority.*
Source: Søndergaard, J., (2023), 'Undeclared Danish Labor: Using the labor input method with linked individual-level tax data to estimate undeclared work in Denmark', in the Journal of Economic Behavior & Organization, Volume 214, October 2023, Pages 708-730.
[ii] *Electronic income data (eIncome).*
[iii] *Søndergaard (2023), Undeclared Danish Labor.*