**Final Report**

Development/Maintenance of the Labour Market Model

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Vienna

in cooperation with

University of St.Gallen

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June 2012

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Executive Summary

Striving to improve their understanding of transmission mechanisms of labour market policies in the context of the European Employment Strategy, the European Commission commissioned external experts from the Institute for Advanced Studies in Vienna and the University of St. Gallen to design and set up a new *labour market model* (LMM), as main component of the project *Modelling of Labour Markets in the European Union* (Berger et al. (2009)). The LMM complements existing models of the Commission such as the Quest III model applied by DG ECFIN. LMM is used to provide a theoretical and empirical basis for identifying the direction and intensity of the impact of labour market policies. The call for tenders for the current project, *Development/maintenance of the labour market model* was issued in the context of the implementation of the 2010 Annual Work Plan of PROGRESS and is, thus, a follow-up project to the project *Modelling of Labour Markets in the European Union*.

This study is intended to allow the Commission to further operationalise the labour market model. The aim is mainly the extension of the calibration of the dynamic general equilibrium model called *Labour Market Model* (LMM) for additional European countries. In the previous study, the model was calibrated for six countries, namely Austria, Germany, Denmark, Italy, Poland and the UK. In the present project, additional eight countries are reflected in the model such that simulations for fourteen European countries are now possible. The additional countries are the Czech Republic, Spain, France, the Netherlands, Sweden, Belgium, Slovakia and Finland. This extension makes it possible to perform an analysis of a wide range of reform scenarios for several European countries reflecting a major share of the population of the European Union.

The previous project strongly focussed on the modelling even though a description on how the calibration of the model functions and illustrative reform scenarios are included in the Final Report. In the current study, the main focus lies on how calibration works. Two steps are necessary for the calibration: firstly, it is necessary to provide an overview about the different institutions in the modelled countries. Secondly, these institutions must be operationalised to be included in the model. For several variables this information can be entered directly into the model without any further manipulation. In other cases, it is necessary to understand the implications and to set the parameters accordingly. In this report we describe these institutions and how this translation into the model is performed. In order to facilitate the Commission's future work with the model, the authors attempt at improving the user friendliness of the calibration procedure, which may have been limited up to now.

The information about institutions is mostly based on information provided by the EU and the OECD. Examples are the OECD Benefits and Wages database or the MISSOC database of the European Union. Apart from the characterization of the legal systems, actual data such as the OECD Revenue Statistics or the Labour Force Survey and EU-SILC of Eurostat also provide necessary and comprehensive information which are used for the calibration. This information consists either of aggregate data needed for the calibration or individual data, which allow the aggregation within modelled age- and skill-groups. The latter information is implemented in the model by using averages. The steps taken during the calculation process are explained broadly in this report, but not exhaustively. Additional information is provided to the European Commission in separate files. Furthermore, individual data are processed with Stata. The routines used to derive group averages are also not described in this report but provided to the European Commission. We add relevant comments which should permit to understand the functioning of the procedure, the input- and the output-variables. An overview is provided in the following table.

Parameters	*Main Data Sources*
Labour market data (e.g. (un-)employment rates, training intensity, dismissals)	LFS, EU-SILC
Various forms of income	EU-SILC
Revenue structure and tax rates	OECD (Revenue Statistics and Tax and Benefit Models), EU-SILC
Institutional details	National experts, MISSOC, European Commission and OECD publications, national sources
Behavioural parameters (e.g. labour supply elast., production function, human capital formation)	Scientific empirical economic literature
Employment Protection Legislation	OECD EPL Index, LFS
Macroeconomic aggregates	SNA
Capital stock	OECD STAN database
Demographic structure	Eurostat
Consumption profile	Eurostat

In this report, we comprehensively describe the social security systems of the fourteen European countries as they are major determinants of the impact of labour market reforms. This comprises (public) pension systems, unemployment systems and other social benefits. This overview is mainly based on the MISSOC database, the OECD Benefits and Wages

database and OECD's Pensions at a Glance. These chapters illustrate that these systems often differ to a large extent, which can imply different outcomes of policy reforms in the countries. Furthermore, the tax- and social security contributions systems are described in this report. We describe the important pillars of the systems as well as how these pillars are implemented in the calibration procedure.

The Final Report of the first project contains a list of variables used in the model. To improve the understanding of the model additional information is helpful. We take this into account by providing a list of variables and parameters and a description of each of them. In addition we describe the type, dimension and source for the programme code. The type of the variables is distinguished between parameters, policy parameters, endogenous variables and technical terms. The term 'Source for the code' describes whether the variable is imported for the calibration or derived in the calibration process. We feel that this information will considerably help to improve the comprehensibility of the program code of the general equilibrium model LMM.

Updating calibration of the model requires a lot of information on different countries since various institutions are represented in the model and the information is needed for the different age- and skill-groups as well as the various decisions reflected in the model. As a kind of check-list the appendix lists the variables which need to be derived in an update of the calibration. As many of the values are based on information of the Labour Force Survey or the EU-SILC, the Stata files can be used to derive the necessary variables with only slight modifications. Institutional details are often rather invariant, at least concerning the main pillars of the systems. Nevertheless, an update of the model requires to check whether important changes happened which should be reflected in the model.

Another part of this report describes the impact of three reform scenarios in the modelled countries. We analyze how an increase of the income tax, a decrease of social security contributions for low income workers and a subsidy of firm-sponsored training influence the economy. The simulation results with the LMM show that the impact in the modelled countries is often quite different. A discussion of the effects of policy reforms on major macroeconomic indicators, such as GDP, private consumption, employment, physical investment or unemployment, will reveal possibly different outcomes in the countries under study. In the following analysis, we will mainly concentrate on the effects on the labour market. The different outcomes are the result of either different preferences in the countries or of different institutional details. Initially, we describe the long-run effects of the reform and discuss why the results in the countries differ. In many cases, simulation results to a large extent depend on the institutions in the countries. These institutions influence the behaviour of economic agents such that different reforms together with these institutions lead to different results. In addition, we analyse the dynamic behaviour. The dynamic is largely determined by the adjustment of the capital stock, the educational attainment over time and

the impact of the pension system. Demographic changes are not taken into account in these simulations but are quite easy to implement in the model.

An increase of the income tax (by an amount of 0.5 percent of GDP) would have negative effects on GDP and these effects would be especially pronounced in Italy, Spain, the Czech Republic and the Netherlands. This is also reflected in the change of the employment figure which is stronger than in other countries. The reason for the higher effect in Spain and the Czech Republic is the higher capital share such that the reform in percent of the wage costs is higher than in other countries. In Italy, the reform would have a larger participation effect such that employment also changes significantly. The long-run GDP effect varies between -0.46 percent and -0.71 percent, the employment effect between -0.3 percent and -0.5 percent. On average the investment effect is more than 50 percent higher than the employment effect. With the exception of the Netherlands, there is a strong relation between employment and capital with the GDP effect. In the Netherlands, a comparably strong skill-shift towards low-skilled persons leads to a lower employment but stronger investment effect. Unemployment rises by between 0.1 and 0.2 percentage points with the sharpest increases in Spain and the Netherlands. At values ranging from -1.06 percent to -1.42 percent, the effect on private consumption is more similar in all the countries. The reason for this effect is that private consumption is also influenced by the higher tax revenues themselves (because of the reduction of disposable household income), which are the same in all countries and not only the effect of the tax change on the economic activity.

The dynamic adjustment is characterised by an initial impact on GDP and employment which is considerably lower than the long-run effect. The reason for that development is the decrease of the capital stock over the horizon as well as the skill-shift towards low-skilled persons. The simulation results show that, on the one hand, there are countries for which the dynamic is relatively flat like Sweden and, on the other hand, countries with a stronger effect over time like Italy and Spain. This pattern shows that it is important to analyse the dynamic adjustment as well in order to attain a comprehensive view about the impact of a reform.

The economic impact of the second reform, a change of employer's social security contributions is generally assumed to be very similar to an income tax reform as both affect the tax wedge between labour compensation and net labour income. Again, the size of the reform amounts to 0.5 percent of GDP, but, in contrast to the first reform, we assume a reduction of the contribution rates for low-income workers instead of a tax rate increase. However, the simulations show that the results are rather different from the income tax reform, even though the range of the reform is the same. The GDP effect of the social security decrease is significantly lower than that of the income tax reform. Whereas the impact on employment is very similar on average (unweighted), investment reactions differ significantly. For the income tax reform, investment changes by about 0.6 percent, whereas it changes only by about 0.1 percent for the social security reform. This different pattern is due to the distinct target groups. The income tax reform mainly increases the burden for medium-

and high-skilled persons, the social security reform is much more concentrated on the low-skilled population. Given capital-skill complementarity in the production, different labour supply behaviour and productivities, this leads to different investment incentives and therefore also GDP effects.

The third reform, subsidies for firm-sponsored training, deals with the trend of the growing importance of human capital for the competitiveness of economies. A better trained staff will be more productive, more innovative and also less unemployed. A training subsidy as implemented in the reform scenario consists of two components. First, it subsidizes training such that one would expect firms to invest more in firm-sponsored training as costs arising to the firms will be partially financed by public sources. This will influence the training decision, to the effect that additional training will be provided. Second, and to some extent even more important, it is an implicit employment subsidy as it is paid only to employed persons. As part of the staff already takes part in training measures the subsidy is granted also to training courses which would have been provided to the staff anyway. This is often called *deadweight costs* as these subsidies will not alter the behaviour but leads to additional costs for the public budget. Nevertheless, these subsidies can lead to employment effects. Without the subsidy there will be firms which will not employ or layoff persons as these persons must be trained which comes with additional costs aside from wages. The subsidy increases the rent of an employee-employer match such that employment increases.

The simulation shows that the employment effect of the reform is rather high (for example compared to the tax reform) which suggests that the second influence of the subsidy is quite important. Even though labour costs rise, firms benefit as they receive the subsidy such that net costs decrease. On the other hand, the impact on productivity is rather modest but contributes additionally to higher labour demand. The impact on GDP is on average even higher than the employment effect. First, average productivity of a worker increases as a result of the higher training intensity. Second, the training subsidies are to some extent more concentrated on medium- and high-skilled persons who receive on average more training than low-skilled individuals.

Résumé

Dans le contexte de la stratégie européenne pour l'emploi, la Commission européenne a chargé des experts externes de l'Institut für Höhere Studien de Vienne (IHS) et de l'Université de Saint-Gall de concevoir un modèle de marché du travail *(Labour Market Model,* LMM) afin de mieux comprendre les mécanismes de transmission des réformes du marché du travail. Ce modèle est l'un des principaux composants du projet de modélisation des marchés du travail au niveau européen (*Modelling of Labour Markets in the European Union* (Berger et al. (2009)). Le LMM vient compléter d'autres modèles existants de la Commission, tels que le modèle Quest III de la Direction générale des affaires économiques et financières de la Commission européenne. Son rôle est de fournir une base théorique et empirique pour analyser l'impact de différentes réformes sur le marché du travail au niveau qualitatif et au niveau quantitatif. L'appel d'offres pour ce projet de développement d'un modèle de marché du travail *(Development/maintenance of the labour market model)* a été lancé dans le cadre du programme de travail annuel 2010 de PROGRESS. Ce projet s'inscrit dans la continuité du projet de modélisation des marchés du travail au niveau européen.

Ce projet doit permettre à la Commission européenne de rendre le modèle LMM plus opérationnel. L'objectif est d'effectuer le calibrage du modèle d'équilibre général dynamique baptisé LMM (*Labour Market Model*) sur un nombre accru de pays. Dans le projet précédent, le modèle était calibré pour six pays, à savoir l'Autriche, l'Allemagne, le Danemark, l'Italie, la Pologne et le Royaume-Uni. Le modèle actuel prend en compte huit pays supplémentaires. Ainsi, il est désormais possible d'effectuer des simulations pour quatorze pays d'Europe. Ces huit nouveaux pays sont la République tchèque, l'Espagne, la France, les Pays-Bas, la Suède, la Belgique, la Slovaquie et la Finlande. Cette extension du modèle permet d'analyser un large éventail de scénarios de réformes pour plusieurs pays d'Europe représentants une grande partie de la population de l'Union européenne.

Si le rapport final du projet précédent décrit la manière dont le modèle a été calibré et fournit des exemples de scénarios de réformes, il met surtout l'accent sur la modélisation. Le projet actuel se concentre quant à lui sur la manière dont fonctionne le calibrage. Pour ce faire, deux étapes sont nécessaires : premièrement, fournir une vue d'ensemble des différentes institutions présentes dans chaque pays. Deuxièmement, intégrer ces institutions au sein du modèle. Pour certaines variables, les informations peuvent être entrées directement. Pour d'autres, il est nécessaire de comprendre les implications de ces institutions et de définir les paramètres du modèle en conséquence. Ce rapport décrit les institutions concernées et la manière de les intégrer dans le modèle. Afin de faciliter l'utilisation du modèle par la Commission, la convivialité, auparavant limitée, du processus de calibrage a été autant que possible améliorée.

Les informations relatives aux institutions proviennent principalement de deux sources : l'UE et l'OCDE. La base de données de l'OCDE sur les prestations et salaires et la base de données MISSOC de l'Union européenne ont notamment été utilisées. Outre les spécificités des systèmes juridiques, des sources de données pertinentes comme les statistiques sur les revenus de l'OCDE ou l'Enquête sur les forces de travail (Labour Force Survey, LFS) et l'EU-SILC (enquête sur les revenus et conditions de vie) d'Eurostat ont servi pour le calibrage. Elles sont de deux natures: soit des données agrégées, soit des données individuelles qui peuvent être agrégées au sein des différents groupes d'âge et de compétence. Ces dernières sont intégrées dans le modèle en utilisant des moyennes. Ce rapport décrit en détails certaines des étapes du processus de calcul. D'autres informations sont transmises à la Commission européenne dans des fichiers séparés. Le logiciel Stata a été utilisé pour le traitement des données individuelles. Ce rapport ne décrit pas les routines qui ont permis d'obtenir les moyennes des groupes, mais ces informations sont également transmises à la Commission européenne dans des fichiers distincts. Figurent également dans ce rapport des commentaires pertinents pour comprendre le fonctionnement de la procédure, ainsi que les variables d'entrée et de sortie. Le tableau ci-après offre un aperçu des différentes sources de données.

Paramètres	*Principales sources de données*
Données sur le marché du travail (ex. taux d'emploi/taux de chômage, formation, licenciements)	LFS, EU-SILC
Différentes formes de revenus	EU-SILC
Structure des revenus et taux d'imposition	OCDE (statistiques sur les revenus et modèles sur les impositions et prestations), EU-SILC
Données sur les institutions	Experts nationaux, MISSOC, publications de la Commission européenne et de l'OCDE, sources nationales
Paramètres relatifs aux comportements (ex. élasticité de l'offre du travail, fonction de production, formation du capital humain)	Littérature économique empirique scientifique
Législation en matière de protection de l'emploi	Indice LPE de l'OCDE, LFS
Agrégats macroéconomiques	SCN
Stock de capital	Base de données STAN de l'OCDE
Structure démographique	Eurostat
Profil de consommation	Eurostat

Ce rapport décrit en détail les systèmes de protection sociale des quatorze pays européens. Ces systèmes jouent un rôle déterminant dans l'impact des réformes sur le marché du travail. Sont pris en compte les systèmes de retraite (publics), les systèmes d'indemnisation du chômage et d'autres prestations sociales. Ces informations sont extraites de la base de données MISSOC, de la base de données de l'OCDE sur les prestations et salaires et des données de l'OCDE sur les retraites. On constate que ces systèmes sont hétérogènes. C'est pourquoi une même réforme peut aboutir à des résultats très différents d'un pays à l'autre. Ce rapport présente également les principaux fondements des systèmes d'imposition et de cotisations de sécurité sociale et la manière dont ils sont intégrés dans le calibrage.

Le rapport final du projet précédent répertorie les variables du modèle. Des informations complémentaires sont toutefois utiles pour bien comprendre le modèle. C'est pourquoi ce rapport répertorie les variables et les paramètres, en donne une description détaillée et indique pour chacun d'entre eux le type, la dimension et la source pour le code de programmation. On distingue les catégories de variables suivantes : paramètres de type, paramètres de réforme, variables endogènes et termes techniques. La « source du code » indique si la variable est importée pour le calibrage ou si elle dérive du processus de calibrage. Ces informations devraient faciliter la compréhension du modèle d'équilibre général LMM.

Pour modifier le calibrage du modèle, un grand nombre d'informations sur chacun des pays concernés sont nécessaires. Ceci en raison de leurs institutions propres, des données relatives aux groupes d'âge et de compétence et des choix spécifiques reflétés dans le modèle. L'annexe contient une forme de check-list qui répertorie les variables qui doivent être calculées lorsqu'on modifie le calibrage. Un grand nombre de valeurs étant basées sur les données de l'Enquête sur les forces de travail et de l'EU-SILC, on peut utiliser les routines Stata pour calculer les variables requises en procédant simplement à quelques modifications. Les données sur les institutions de chaque pays varient rarement, tout du moins celles concernant les fondements du système. Lors de la mise à jour du modèle, il est néanmoins nécessaire de vérifier si des changements ont eu lieu et doivent être intégrés.

Une partie de ce rapport étudie également l'impact de trois scénarios de réformes dans les pays concernés. Nous analysons comment une augmentation de l'impôt sur le revenu, une baisse des cotisations de sécurité sociale pour les bas salaires et une subvention pour les formations financées par l'entreprise influencent l'économie. Comme le montrent les résultats de la simulation avec le LMM, les réformes ont des répercussions différentes d'un pays à l'autre. Les effets des réformes sur des indicateurs macroéconomiques clés tels que le PIB, la consommation des ménages, l'emploi, l'investissement ou le chômage divergent pour chaque pays. Notre analyse se concentre sur les effets de ces réformes sur le marché du travail. Les divergences s'expliquent par les préférences individuelles propres à chaque pays ou par la spécificité de leurs institutions. Pour chacun des trois scénarios, nous analysons les effets à long terme des réformes et les différences de résultats d'un pays à

l'autre. Bien souvent, les résultats dépendent des institutions qui influencent le comportement des agents économiques. Par ailleurs, nous analysons le comportement dynamique dans chaque pays. La dynamique dépend fortement de l'ajustement du stock de capital, des décisions de formation et de l'impact du système de retraite. Les changements démographiques ne sont pas pris en compte dans ces simulations, mais peuvent facilement être intégrés dans le modèle.

Une augmentation de l'impôt sur le revenu (montant de la réforme équivalent à 0,5 pour cent du PIB) entraîne des effets négatifs sur le PIB, tout particulièrement en Italie, en Espagne, en République tchèque et aux Pays-Bas. Le constat est le même pour l'emploi, plus touché par cette réforme que dans les autres pays. En Espagne et en République tchèque, ce résultat s'explique par le pourcentage de capital plus élevé. De ce fait, la réforme entraîne des coûts salariaux plus élevés en pourcentage que dans les autres pays. En Italie, l'augmentation de l'impôt sur le revenu entraîne au contraire une participation accrue au marché du travail qui se répercute elle aussi nettement sur l'emploi. L'effet à long terme sur le PIB varie entre
-0,46 pour cent et -0,71 pour cent, celui sur l'emploi entre -0,3 pour cent et -0,5 pour cent. En moyenne, l'effet sur l'investissement est près de 50 pour cent supérieur à celui sur l'emploi. A l'exception des Pays-Bas, on constate une étroite corrélation entre l'emploi et le capital d'une part, et l'impact sur le PIB d'autre part. Aux Pays-Bas, un transfert vers les travailleurs peu qualifiés donne lieu à des répercussions plus faibles sur l'emploi, mais plus marquées sur l'investissement. Le chômage augmente de 0,1 à 0,2 point de pourcentage, les augmentations les plus fortes concernant l'Espagne et les Pays-Bas. Avec des valeurs comprises entre -1,06 pour cent et -1,42 pour cent, l'effet sur la consommation des ménages est relativement moins fort que sur les autres agrégats macroéconomiques. La raison est la suivante : la consommation des ménages n'est pas seulement influencée par les conséquences de la réforme sur l'activité économique, mais également par la réforme elle-même (en raison de la réduction des revenus disponibles) qui augmente l'impôt sur le revenu de manière identique dans tous les pays.

L'ajustement dynamique est caractérisé par un impact initial sur le PIB et l'emploi nettement inférieur à l'impact sur le long terme. Ceci s'explique par la diminution au fil du temps du stock de capital ainsi que par un transfert de la formation vers les personnes peu qualifiées. Les résultats de la simulation indiquent, d'une part, que la dynamique est relativement uniforme dans certains pays comme la Suède, et d'autre part, que l'impact dans le temps est plus fort pour certains pays comme l'Italie et l'Espagne. Ces exemples montrent que l'analyse de l'ajustement dynamique est nécessaire pour obtenir une vue d'ensemble de l'impact de la réforme.

L'impact économique de la deuxième réforme, à savoir la modification des cotisations de sécurité sociale de l'employeur, est généralement reconnu comme très comparable à l'effet d'une réforme de l'impôt sur le revenu dans la mesure où tous deux affectent le coin fiscal

entre le coût de la main-d'œuvre et son revenu net. Le montant de la réforme équivaut une fois encore à 0,5 pour cent du PIB, mais, contrairement à la première réforme, on analyse une réduction des taux de cotisation pour les bas salaires au lieu d'une augmentation du taux d'imposition. La simulation révèle toutefois des résultats très différents de ceux de la réforme de l'impôt sur le revenu, même si le montant de la réforme est identique. L'impact sur le PIB est nettement inférieur à celui de la réforme de l'impôt sur le revenu. Alors que l'impact sur l'emploi est comparable en moyenne (non pondérée), l'effet sur l'investissement est beaucoup plus restreint. Dans le cas de la réforme de l'impôt sur le revenu, l'investissement varie d'environ 0,6 pour cent, contre seulement 0,1 pour cent environ dans le cas de la deuxième réforme. La raison de ce décalage se situe dans la différence des groupes cibles. La réforme de l'impôt sur le revenu pèse principalement sur les travailleurs moyennement et hautement qualifiés ; la réforme sur les cotisations de sécurité sociale quant à elle affecte surtout les travailleurs peu qualifiés. Etant données la complémentarité du capital et de la qualification dans la production et la disparité des comportements d'offre de main-d'œuvre et de la productivité, il en résulte des incitations à l'investissement différentes et par conséquent des effets sur le PIB également différents.

La troisième réforme, à savoir des subventions pour les formations financées par l'entreprise, a pour cible l'importance croissante du capital humain pour la compétitivité économique. Une main-d'œuvre mieux formée est plus productive, plus innovante et moins touchée par le chômage. La subvention pour la formation de ce troisième scénario regroupe deux composantes. Premièrement, elle subventionne la formation. Elle incite donc les entreprises à investir davantage dans la formation de leurs employés, le coût de cette formation étant en partie à la charge du contribuable. Elle a une influence directe sur les décisions de formation. Deuxièmement, et plus important encore, elle constitue une subvention implicite en faveur de l'emploi puisque ce sont les salariés qui la touchent. Une partie des salariés participant déjà à des formations avant l'introduction de la réforme, la subvention finance alors des formations déjà prévues initialement. On parle souvent *d'effet d'aubaine* puisque ces subventions ne modifient pas les comportements et font peser un coût supplémentaire sur le budget de l'Etat. Néanmoins, ces subventions ont des répercussions sur l'emploi. Sans elles, certaines entreprises n'embaucheraient pas ou pourraient même licencier les employés ayant besoin d'une formation, en raison du coût qu'elle représente. Ainsi, en augmentant le rendement du travail la subvention favorise l'emploi.

La simulation montre que la réforme a un impact fort sur l'emploi (comparé à celui de la réforme de l'impôt sur le revenu, par exemple), ce qui suggère que la deuxième composante de la subvention est déterminante. Même si le coût de la main-d'œuvre augmente, la subvention entraîne une diminution du coût net de la main-d'œuvre pour l'entreprise. D'autre part, si l'impact sur la productivité est plutôt limité, la réforme contribue à une hausse de la

demande de main-d'œuvre. L'impact sur le PIB est même supérieur en moyenne à celui sur l'emploi. Premièrement, la productivité moyenne d'un travailleur augmente du fait d'une meilleure formation. Deuxièmement, la subvention pour la formation profite davantage aux personnes moyennement et hautement qualifiées puisqu'elles bénéficient en moyenne plus souvent de formations que les travailleurs peu qualifiés.

Zusammenfassung

Die Europäische Kommission hat im Rahmen des Projekts *Modelling of Labour Markets in the European Union* (Berger et al. (2009)) externe Experten des Instituts für Höhere Studien in Wien und der Universität von St. Gallen damit beauftragt, ein Arbeitsmarktmodell (Labour Market Modell – LMM) zu entwickeln, um Transmissionsmechanismen von Arbeitsmarktreformen besser zu verstehen. LMM stellt eine wichtige Ergänzung zu anderen Modellen der Europäischen Kommssion, wie z.B. das Quest III Modell von DG ECFIN, dar. Es wird dafür verwendet, eine theoretische und empirische Grundlage der Auswirkungen verschiedener Arbeitsmarktreformen zu analysieren. Die Ausschreibung für das vorliegende Projekt, *Development/maintenance of the labour market model*, fand im Kontext der Implementierung des jährlichen Arbeitsprogramms von PROGRESS statt und ist ein Folgeprojekt zu *Modelling of Labour Markets in the European Union*. Die vorliegende Studie hat zum Ziel, Simulationen für eine größere Anzahl von Staaten zu ermöglichen, indem die Kalibrierung des allgemeinen dynamischen Gleichgewichtsmodells mit dem Namen *Labour Market Model* (LMM) auf zusätzliche europäische Staaten ausgeweitet wird. In der ersten Studie wurde das Modell für sechs Staaten, nämlich Österreich, Deutschland, Dänemark, Italien, Polen und Großbritannien, kalibriert. In dem vorliegenden Projekt werden zusätzliche acht Staaten in das Modell inkludiert, sodass nun Simulationen für vierzehn europäische Staaten möglich sind. Diese zusätzlichen Staaten sind die Tschechische Republik, Spanien, Frankreich, die Niederlande, Schweden, Belgien, die Slowakei und Finnland. Diese Erweiterung ermöglicht nun eine Analyse einer breiten Palette an Reformszenarien für eine Vielzahl europäischer Staaten, welche einen Löwenanteil an der Bevölkerung der Europäischen Union umfassen.

Das vorangegangene Projekt fokussierte sehr stark auf die Modellierung des LMM, obgleich auch die Kalibrierung des Modells beschrieben und beispielhafte Reformszenarien durchgeführt wurden. Die Kalibrierung nimmt in der vorliegenden Studie einen breiten Raum ein. Zur Kalibrierung des Modells sind zwei Schritte notwendig. Erstens ist es notwendig, einen Überblick über die unterschiedlichen Institutionen in den relevanten Staaten zu erhalten. Zweitens müssen diese Institutionen in das Modell übersetzt werden. Für einige Variablen können diese Informationen direkt ohne weitere Behandlung in das Modell inkludiert werden. In anderen Fällen ist es notwendig, die Implikationen dieser Institutionen zu verstehen und die Modellparameter entsprechend zu setzen. In diesem Bericht werden diese relevanten Institutionen beschrieben, und es wird dargelegt, wie die Übersetzung in das Modell erfolgte. Um die zukünftige Arbeit der Europäischen Kommission mit diesem Modell zu erleichtern wurde versucht, die Benutzerfreundlichkeit der Kalibrierungsprozedur zu verbessern, die möglicherweise bisher eingeschränkt war.

Die Basis für die relevanten Informationen unterschiedlicher Institutionen bilden großteils Datenbanken der EU und der OECD. Beispiele sind die OECD Benefits and Wages Publikationen oder die MISSOC Datenbank der Europäischen Union. Neben der Beschreibung der rechtlichen Aspekte werden Datenquellen herangezogen, welche für die Kalibrierung notwendig sind, wie etwa die OECD Revenue Statistics oder der Labour Force Survey und der EU-SILC von Eurostat. Diese Informationsquellen beinhalten entweder aggregierte Informationen oder Daten auf individueller Ebene, wobei im letzteren Fall eine Aggregation auf die modellierten Alters- und Ausbildungsgruppen notwendig ist. Alters- und ausbildungsgruppenspezifische Informationen werden daher auf Basis von Durschnitten implementiert. Die durchgeführten Schritte werden in diesem Bericht auf breiter Basis diskutiert, teilweise aber nicht abschließend. Einige Berechnungsschritte werden der Europäischen Kommission in separaten Dateien zur Verfügung gestellt. Das Bearbeiten der Individualdaten wird in Stata durchgeführt. Die hierfür notwendigen Programme werden in diesem Bericht nicht dargestellt, aber ebenfalls der Kommission übermittelt. Es wurden hinreichend Kommentare in die Programme eingefügt, was deren Verständlichkeit ermöglichen sollte, sowie die Input- und Outputvariablen beschrieben. Einen Überblick über die verwendeten Datenquellen bietet die nachfolgende Tabelle.

Parameter	Wichtigste Datenquellen
Arbeitsmarktdaten (z.B. Arbeitslosen- bzw. Be-schäftigungsquoten, Weiterbildung, Kündigungen)	LFS, EU-SILC
Verschiedene Formen von Einkommen	EU-SILC
Einnahmenstruktur und Steuersätze	OECD (Revenue Statistics und Tax and Benefit Models), EU-SILC
Institutionelle Details	Nationale Experten, MISSOC, Europäische Kommission und OECD Publikationen, Nationale Quellen
Verhaltensparameter (z.B. Arbeitsangebotselastizitäten, Produktionsfunktion, Humankapitalbildung)	Wissenschaftliche empirische ökonomische Literatur
Kündigungsschutzregelungen	OECD EPL Index, LFS
Makroökonomische Aggregate	SNA
Kapitalstock	OECD STAN Datenbank
Demographische Struktur	Eurostat
Konsumprofil	Eurostat

In diesem Bericht werden die relevanten Teile der einzelnen Sozialversicherungssysteme der vierzehn Länder umfassend beschrieben. Diese Systeme sind wichtige Bestimmungsgrößen für die Auswirkungen von Arbeitsmarktreformen. Die beschriebenen Systeme umfassen das (öffentliche) Pensionssystem, das Arbeitslosensystem und andere soziale Transfers. Dieser Überblick basiert auf der MISSOC Datenbank sowie den Publikationen der OECD Benefits and Wages und Pensions at a Glance. Es wird aufgezeigt, dass die Systeme wichtige Unterschiede aufweisen, die bei Politikreformen zu merklichen Unterschieden in den einzelnen Ländern führen können. Ebenso werden die Abgabensysteme diskutiert. Wir beschreiben wichtige Säulen dieser Systeme sowie die Implementierung in die Kalibrierungsprozedur.

Der Schlussbericht des vorangegangenen Projekts beinhaltet eine Variablenliste des Modells. Zusätzliche Information ist nützlich, um die Verständlichkeit des Modells zu verbessern. Daher wird eine Liste der Variablen und Parameter sowie deren Beschreibung in den Bericht hinzugefügt. Zusätzlich werden für jede Variable bzw. jeden Parameter der Typ, die Dimension sowie die Quelle für den Programm-Code angegeben. Variablen werden in die Typen Parameter, Politikparameter, endogene Variable und technischer Term unterschieden. Die Quelle besagt, ob die Variablenausprägung für die Kalibrierung importiert wird oder im Kalibrierungsprozess berechnet wird. Die Autoren sind der Meinung, dass diese Information helfen kann, die Verständlichkeit des allgemeinen Gleichgewichtsmodells LMM zu erhöhen.

Die Aktualisierung der Kalibrierung des Modells benötigt eine Vielzahl von Informationen für die einzelnen Länder. Dies ist eine Folge der verschiedenen Institutionen und Informationen für die einzelnen Alters- und Ausbildungsgruppen sowie der verschiedenen Entscheidungen im Modell. Als eine Art Checkliste enthält der Appendix eine Liste von Variablen, welche für ein Kalibrierungsupdate ermittelt werden müssen. Da viele Werte auf Informationen des Labour Force Survey oder des EU-SILC basieren, können Stata Programme verwendet werden, um die notwendigen Variablen zu ermitteln, wobei möglicherweise kleinere Anpassungen in den Programmen notwendig sind. Institutionen in den einzelnen Ländern sind oftmals eher stabil, zumindest die Grundpfeile der Systeme. Nichtsdestoweniger ist bei einem Update eine Überprüfung dahingehend notwendig, ob wichtige Veränderungen stattgefunden haben, welche im Modell reflektiert werden sollten.

Ein weiterer wichtiger Teil des Berichts beschreibt den Einfluss dreier unterschiedlicher Reformen in den modellierten Staaten. Wir untersuchen die Auswirkungen einer Erhöhung der Einkommensteuerbelastung, einer Senkung von Sozialversicherungsbeiträgen für Personen mit geringem Einkommen und einer Subvention von unternehmensfinanzierten Weiterbildungsausgaben. Wie die Simulationsergebnisse mit LMM zeigen, sind die Auswirkungen in den modellierten Staaten oft recht unterschiedlich. Die Diskussion über die Effekte der Politikänderungen auf wichtige makroökonomische Indikatoren, wie BIP, privater Konsum, Beschäftigung, Investitionen und Arbeitslosigkeit, zeigt die unterschiedlichen

Auswirkungen auf. In der Analyse wird vor allem auf Arbeitsmarkteffekte abgestellt. Diese Variation in den Ergebnissen ist das Resultat unterschiedlicher Präferenzen oder institutioneller Details in den einzelnen Staaten. Für jede der drei Simulationen werden zuerst die langfristigen Effekte der Reform sowie Differenzen in den einzelnen Staaten diskutiert. Die Ergebnisse hängen merklich von den Institutionen ab, welche das Verhalten der ökonomischen Agenten beeinflussen, sodass teilweise merkliche Abweichungen in den Ergebnissen zu finden sind. Zusätzlich wird auch die Dynamik in den modellierten Ökonomien dargestellt. Die Dynamik ist großteils durch die Anpassung des Kapitalstocks, die Bildungsentscheidungen und den Einfluss der Pensionssysteme determiniert. Demographische Veränderungen werden in diesen Simulationen nicht berücksichtigt, sind jedoch in das Modell relativ einfach zu implementieren.

Eine Erhöhung der Einkommensteuer (unterstelltes Reformvolumen von 0,5 Prozent des BIP) hat negative Auswirkungen auf das BIP, welche in Italien, Spanien, der Tschechischen Republik und den Niederlanden besonders ausgeprägt ausfallen. Dies zeigt sich auch in der Veränderung der Beschäftigung, welche stärker als in den anderen Staaten ist. Der Grund für den stärkeren Effekt in Spanien und der Tschechischen Republik liegt in der höheren Kapitalquote, sodass die Reform in Prozent der Arbeitskosten höher ist als in den anderen Staaten. In Italien hingegen führt die Einkommensteuererhöhung zu einem stärkeren Partizipationseffekt, sodass sich auch die Beschäftigung beträchtlich verändert. Der langfristige BIP-Effekt variiert zwischen -0,46 Prozent und -0,71 Prozent, der langfristige Beschäftigungseffekt bewegt sich zwischen -0,3 Prozent und -0,5 Prozent. Im Schnitt ist der Investitionseffekt um etwa 50 Prozent höher als der Beschäftigungseffekt. Mit Ausnahme der Niederlande gibt es einen engen Zusammenhang zwischen Beschäftigung bzw. Kapital mit der BIP-Veränderung. In den Niederlanden führt ein vergleichbar stärkerer Ausbildungseffekt zu einem niedrigeren Beschäftigungs-, aber höheren Investitionseffekt. Die Arbeitslosigkeit steigt zwischen 0,1 und 0,2 Prozentpunkte wobei der stärkste Anstieg in Spanien und den Niederlanden auftritt. Mit Werten von -1,06 Prozent bis -1,42 Prozent variieren die Ergebnisse für den privaten Konsum weniger stark als bei den anderen makroökonomischen Aggregaten. Der Grund dafür liegt darin, dass der private Konsum nicht nur von den Wirkungen der Reform auf die Volkswirtschaft beeinflusst wird, sondern auch durch die Reform selbst (aufgrund der Reduktion der verfügbaren Einkommen), welche ceteris paribus in allen Staaten gleich hoch ist.

Die dynamische Anpassung kann folgendermaßen charakterisiert werden. Anfänglich sind der BIP- und Beschäftigungseffekt beträchtlich geringer als der langfristige Effekt. Der Grund hierfür liegt in der Anpassung des Kapitalstocks über die Zeit sowie in einer Verschiebung der Ausbildungsstruktur in Richtung geringerer Qualifikation. Die Dynamik zeigt, dass es einerseits Staaten gibt, für welche sie relativ flach verläuft, wie in Schweden, und andererseits Staaten, in welchen eine wesentlich stärkere Dynamik zu beobachten ist, wie in Italien und Spanien. Diese Muster zeigen, dass die Analyse der Dynamik wichtig ist, um ein umfassendes Bild über den Einfluss der Reform zu erhalten.

Die volkswirtschaftlichen Wirkungen der zweiten Reform, einer Veränderung von Sozialversicherungsbeiträgen, werden im allgemeinen als sehr ähnlich zu einer Einkommensteuerreform gesehen, da beide den Steuerkeil zwischen Arbeitskosten und Nettoarbeitseinkommen verändern. In der zweiten Reform wird wiederum ein Reformvolumen von einem halben Prozent des BIP unterstellt, jedoch statt einer Steuersatzerhöhung eine Senkung von Sozialversicherungsbeiträgen für Personen mit geringem Einkommen analysiert. Die Simulation zeigt jedoch sehr unterschiedliche Ergebnisse zur Einkommensteuerreform auf, auch wenn das Reformvolumen dasselbe ist. Der BIP-Effekt ist deutlich geringer als bei der Einkommensteuerreform. Während der Einfluss auf die Beschäftigung im ungewichteten Durchschnitt über die Staaten von vergleichbarem Ausmaß ist, ist die Wirkung auf die Investitionen deutlich geringer. Bei der Einkommensteuerreform verändern sich die Investitionen um 0,6 Prozent, bei der Veränderung der Beiträge zur Sozialversicherung lediglich um 0,1 Prozent. Wesentliche Ursache dafür ist der Unterschied in der Zielgruppe der Reform. Die Einkommensteuerreform senkt die Belastung vor allem bei mittel- und hochqualifizierten Personen, die Sozialversicherungsbeitragsreform zielt wesentlich stärker auf die gering-qualifizierte Bevölkerung ab. Gegeben die Komplementarität zwischen Kapital und Ausbildung in der Produktion und unterschiedliche Arbeitsangebotswirkungen und Produktivitäten führt dies zu unterschiedlichen Investitionsanreizen und daher auch Auswirkungen auf das BIP.

Die dritte Reform, Subventionen für unternehmensfinanzierte Weiterbildung, zielt auf die steigende Bedeutung von Humankapital für die Wettbewerbsfähigkeit von Volkswirtschaften ab. Eine besser ausgebildete Belegschaft ist produktiver, innovativer und auch weniger häufig arbeitslos. Die unterstellte Subvention für Weiterbildung beinhaltet zwei Komponenten. Erstens subventioniert sie Weiterbildung, wodurch Unternehmen stärker in die Weiterbildung ihrer Mitarbeiter investieren, da die Kosten teilweise vom Steuerzahler übernommen werden. Dies beeinflusst die Weiterbildungsentscheidung, d.h. die Frage, ob zusätzliche Weiterbildung angeboten wird. Zweitens, teilweise noch bedeutender, stellt eine solche Subvention auch eine implizite Beschäftigungsförderung dar, da sie nur für beschäftigte Personen in Anspruch genommen werden kann. Da Teile der Belegschaft bereits vor der Einführung der Reform an Weiterbildungsmaßnahmen teilnehmen, wird die Subvention auch für Maßnahmen gewährt, die ohnehin vorgenommen worden wären. Dies wird häufig als *Mitnahmeeffekt* der Subvention bezeichnet, da das Verhalten sich dadurch nicht verändert, jedoch für die öffentlichen Finanzen eine Belastung darstellt. Dennoch kann diese Subvention zu einem Beschäftigungseffekt führen. Ohne diese Förderung würden Unternehmen manche Arbeitnehmer nicht einstellen bzw. kündigen, da sie neben den Lohnkosten auch die Kosten für die Weiterbildung tragen müssten. Somit erhöht die Subvention den Ertrag der Beschäftigung, wodurch diese insgesamt höher ausfällt.

Die Simulation zeigt, dass der Beschäftigungseffekt vergleichbar stark ausfällt (verglichen z.B. mit der Steuerreform), sodass daraus geschlossen werden kann, dass die zweite

Komponente der Subvention sehr bedeutend ist. Obwohl die Arbeitskosten für die Unternehmen steigen, verbleibt den Unternehmen infolge der Subvention ein höherer Nettoertrag der Beschäftigung. Andererseits ist der Einfluss auf die Produktivität eher moderat, führt aber dennoch zu höherer Arbeitsnachfrage. Der Einfluss auf das BIP ist noch stärker als auf die Beschäftigung. Erstens steigt die durchschnittliche Produktivität als Folge der höheren Weiterbildungsintensität an und zweitens zielt die Subvention stärker auf mittel- und hochqualifizierte Personen ab, da diese im Schnitt öfters an Weiterbildungsmaßnahmen teilnehmen als geringqualifizierte Personen.

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1. Introduction

PROGRESS is the European Union's employment and social solidarity programme which was established to provide financial support to the implementation of the objectives of the European Union in employment, social affairs and equal opportunities, as set out in the Social Agenda. It also contributes to the achievement of the *EU Lisbon Growth and Jobs Strategy*. The realisation of the Social Agenda relies on a combination of various instruments comprising EU legislation, the implementation of *open methods of coordination* in various policy fields and financial incentives such as the European Social Fund.

PROGRESS's mission is to strengthen the contribution of the EU in support of Member States' commitments and efforts to support the creation of more and better jobs and to ensure a more cohesive society. It will be instrumental in: i) providing analysis and policy advice on PROGRESS policy areas, ii) monitoring and reporting on the implementation of EU legislation and policies, iii) promoting policy transfer, learning and support among Member States on objectives and priorities of the EU and iv) relaying the views of the stakeholders and society at large.

Striving to improve their understanding of transmission mechanisms of labour market policies in the context of the European Employment Strategy, the European Commission commissioned external experts from the Institute for Advanced Studies in Vienna and the University of St. Gallen to design and set up a new *labour market model* (LMM), as main component of the project *Modelling of Labour Markets in the European Union* (Berger et al. (2009)). The LMM complements existing models of the Commission such as the Quest III model applied by DG ECFIN. LMM is used to provide a theoretical and empirical basis for identifying the direction and intensity of the impact of labour market policies. The call for tenders for the current project, *Development/maintenance of the labour market model* was issued in the context of the implementation of the 2010 Annual Work Plan of PROGRESS and is, thus, a follow-up project to the project *Modelling of Labour Markets in the European Union*.

LMM is a dynamic computable general equilibrium model featuring a detailed description of the labour market. Its equations are derived from an in-depth micro-foundation for the actors involved, namely households (workers and retirees) and firms. Individuals maximise their lifetime utility while firms maximise the present value of profits. The model captures a detailed description of the public sector and relevant institutions (like passive labour market policy). Featuring eight different age groups and three different skill groups, the structure of the household sector is particularly detailed. A short description of the model is presented in the Appendix, Section 5.1. An exhaustive model documentation can be found in Part II of the Final Report of *Modelling Labour Markets in the European Union*.

This *Final Report* is structured as follows: Section 2 provides information on the calibration of the model and institutional details for the different countries. A detailed list of variables can be found in Section 3. Section 4 gives an analysis of the model application to different policy scenarios. The Appendix provides a short description of the labour market model, a list of variables which have to be updated from time to time, specific information for modelling experts of the European Commission and detailed country-specific tables on the dynamic impact of the analysed policy reform scenarios.

2. Calibration and Institutional Details

2.1. Introduction

In the base project, LMM was calibrated for six European countries, reflecting different social role models in the European Union. In the tender specifications, the European Commission requests an extension of the calibration of the model to cover additional countries. This means that we update the variables for the six countries already modelled (i.e. Austria, Germany, Denmark, Italy, Poland and the UK) and expand the calibration to eight further countries such that the model also covers the Czech Republic, Spain, France, the Netherlands, Sweden, Belgium, Slovakia and Finland, believing that this selection provides a comprehensive coverage of all different social role models in the European Union. The selection of countries was also influenced by the fact that all the countries on this list are members of the OECD so that the OECD provides information for all of them. For instance, calibration relies on data from the OECD in the field of the revenue structure of the tax and contribution system (which is taken from the *Revenue Statistics* for the calibration of the LMM), information on individual tax and social security contribution rates (taken from the OECD *Tax and Benefit Models*) and the strictness of a country's Employment Protection Legislation (derived from the EPL Index). Nevertheless, data provided by Eurostat is applied whenever possible. This country selection was also agreed between the European Commission and the contractor at the kick-off meeting in Brussels.

In general, calibration of the model is based on three different types of data sources. The first type are macro(economic) data, the second type microdata and the third type is institutional information of the different countries. Macroeconomic data are mainly used as input for the model if no age- and skill-dependent information is necessary. Examples for macrodata are tax revenues, value added in the economy or the level of aggregate consumption. Microdata are to a large extent based on the Labour Force Survey and the EU-SILC. These datasets provide detailed information which is mainly aggregated within the different age- and skill-groups of the model. Most of the labour market data, such as average activity rates of persons in the different age- and skill-groups or the number of hours worked, are based on these data sources. Institutional details of the social- and labour market system in the different countries exert influence on the decisions of households and firms. Important parameters are for example those which reflect the organisation of the public pension or unemployment system. They influence individual decisions by providing incentives prioritising a specific behaviour.

This section includes a brief classification of the relevant parameters and variables of the model that are calibrated and information for the calibration of variables and parameters. For comprehensiveness, a detailed list of all parameters and variables, that need to be updated, is included in the Appendix, Section 5.2.

In general, we proceed with the calibration procedure in a similar way to the one described in Part II of the final report *Modelling of Labour Markets in the European Union*. Due to the comprehensiveness of the model, its calibration requires a large amount of data input from various and diverse sources. The model distinguishes several age- and skill-groups so that there is a need for a considerable amount of disaggregated household data. Since most of these data cannot be derived from available statistic databases on such a disaggregated level, they are calculated from micro-data sets.

In general, the authors use available data provided by Eurostat, for the following reasons. First and most important, data for a specific parameter or variable usually exists for all Member States. Second, data are to a large extent comparable as the census method is harmonised. Third, it will be easier for the Commission to update the model as their staff has access to the database and the information about the availability of additional data. Even though Eurostat provides much of the necessary data, additional resources are required. We primarily rely on OECD data as the OECD covers all selected countries. Remaining information is mostly obtained from national sources. This is sometimes necessary with respect to institutional settings, as long as the MISSOC database or publications by the European Commission and the OECD do not provide sufficient information. As gathering of information about institutions in the different countries is elaborate, national experts supported the project team.

In order to facilitate the Commission's future work with the model, the authors also attempted at improving the user friendliness of the calibration procedure, which may have been limited up to now. In particular, we improve the user friendliness by implementing the following steps:

- The Appendix includes a comprehensive list of variables which have to be updated.
- We upgraded the structure of the numerous Excel files guiding the calibration procedure in order to make it more concise.
- Excel files/sheets are amended by i) references to other files (mostly Excel or Stata files) which serve as an input for this file; this reference is complemented by hyperlinks between the different files; ii) information on external data sources used in this file and iii) a documentation of calculations in the file.
- In order to be able to work with large micro datasets like the Labour Force Survey or EU-SILC, we apply the database program Stata to derive important variables or parameter values to describe households. In addition to a proficient user knowledge of Gauss, the contractor is also very well acquainted with Stata and the routines used in the base project as well as with handling micro data sets like the Labour Force Survey (LFS) or the EU-SILC. We also invested in the documentation of the Stata files used to process the microdata. Basic knowledge of Stata should enable members of the Commission to perform minor changes or updates in the code on their own if necessary.

Institutional details for the different countries must be implemented in the model with due care. The *MISSOC* database, OECD publications such as *Pensions at a Glance* or *Taxing Wages* and various national sources proved to be very useful for this task. In addition, national experts from the eight additional countries helped to extend our understanding of national institutional settings and improved the quality of the update and calibration of the model parameters. National information is often only available in domestic languages where local experts can help to avoid misleading interpretations and misunderstandings. In order to improve the user friendliness of the calibration of institutional settings, we are also providing a more concrete interface of institutional settings and the parameters used in the model.

Similar to the calibration in the base project, National Accounts are the basis for the calibration of major aggregates like private and public consumption, the capital and labour income share, etc. When it comes to capital stock the *STAN (Structural Analysis)* database of the OECD provides pertinent information.

Most of the relevant empirical data on the labour market are based on information contained in the LFS and the EU-SILC. The individual data are pooled according to the different age and skill groups in the model. These data include, for instance, unemployment and activity rates, training intensity of firms and households and information on dismissal incidences. Furthermore, data on the various types of income, such as labour income, unemployment benefits and other benefits from the government are provided by EU-SILC. The breakdown of the population into several groups reduces the sample size for the calibration substantially. One way to overcome this problem is to merge information from different years. Thus, we integrated the most recent surveys (as of 2004 if available) during this update, which increases the sample size and smoothes the influence of the business cycle and the economic crisis.

We continue to use OECD data for several purposes. We calibrate the tax structure in the different Member States by using the OECD's *Revenue Statistics*. The breakdown of income tax rates and social security contribution rates of employers and employees according to age and education is derived by using the *Tax and Benefit model* of the OECD and income data from the EU-SILC. Furthermore, values that reflect the strictness of Employment Protection Legislation are derived with the help of information provided by the OECD for the calculation of the EPL Index (see e.g. Venn (2009) for a detailed description).

Values of many parameters of behavioural equations and structural parameters (e.g. labour supply elasticities, parameters of the production function, elasticity of inter-temporal substitution) are based on empirical estimates provided by the scientific economic literature.

Table 1: Classification of Relevant Data Input

Parameters	*Main Data Sources*
Labour market data (e.g. (un-)employment rates, training intensity, dismissals)	LFS, EU-SILC
Various forms of income	EU-SILC
Revenue structure and tax rates	OECD (Revenue Statistics and Tax and Benefit Models), EU-SILC
Institutional details	National experts, MISSOC, European Commission and OECD publications, national sources
Behavioural parameters (e.g. labour supply elast., production function, human capital formation)	Scientific empirical economic literature
Employment Protection Legislation	OECD EPL Index, LFS
Macroeconomic aggregates	SNA
Capital stock	OECD STAN database
Demographic structure	Eurostat
Consumption profile	Eurostat

Whereas a classification of required parameters and their main sources can be found in Table 1, the Appendix (Table 33) provides a comprehensive list of all those parameters and variables for which an update is necessary. For completeness, Table 34 in the Appendix lists those variables currently included in the files DataInputXX.xls[1] for which an update is not necessary. The rest of Section 2 includes information for the calibration of major variables of the model.

2.2. Macroeconomic Data

In this section we discuss the different macro(economic) data which are used to calibrate the model. They are in general based on officially available data and can be updated easily.

2.2.1.   Output

In the model we distinguish between output, gross value added (GVA) and gross domestic product (GDP). Given labour- and capital input, the production function determines the output ('y') in the model. This defines the maximum output possible given input factors. We

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[1] XX reflects the different countries in the model.

apply several deductions, reflecting different types of costs, as stated below, to derive GVA. These costs can primarily be seen as time devoted to other tasks than production. These tasks are:

- Costs incurred by filling a vacancy (κ)
- Costs incurred by firm sponsored training ('firmskillcost')
- Costs incurred by managerial effort ('probcost')
- Administrative firing costs (τ^C)

Deducting these costs from output ('y') gives GVA in the economy, or 'gva' in the model. To derive GDP one has to add 'Taxes on Products' and deduct 'Subsidies on Products'. Taxes on products are taken from the OECD revenue statistics, subsidies on products from the annual national accounts.

Variable	Description	Formula
gva	Gross value added	$y - \kappa - firmskillcost - probcost - \tau^C$
gdp	Gross domestic product	$gva + taxes\ on\ products - subsidies\ on\ products$

The values for GDP, taxes on products, subsidies on products and GVA for the year 2009 can be found in Table 2. Calibration is based on information for the years 2004 to 2009. In the model, 'gva' is normalised to 100 for all the countries. For this reason we defined a parameter ('scalingfactor') to be able to derive values in billions of national currency. For example, multiplying 'gva' by 'scalingfactor' gives GVA in billions of national currency.

Table 2: GDP, Taxes and Subsidies on Products and Gross Value Added (2009)

2009 / mio. national currency	*GDP*	*Taxes on products*	*Subsidies on products*	*GVA**
Austria	274,321	33,299	5,622	246,644
Belgium	339,162	38,011	1,823	302,974
Czech Republic	3,625,865	426,834	40,756	3,239,787
Germany	2,397,100	266,682	6,300	2,136,718
Denmark	1,656,108	258,083	12,177	1,410,202
Spain	1,053,914	78,750	5,707	980,871
Finland	171,315	23,366	600	148,549
France	1,907,145	202,128	13,126	1,718,143
Italy	1,520,870	163,401	10,527	1,367,996
Netherlands	571,979	67,808	3,429	507,600
Poland	1,343,657	156,265	4,384	1,191,776
Sweden	3,089,181	423,989	16,426	2,681,618
Slovakia	63,051	6,782	475	56,744
United Kingdom	1,394,989	141,404	5,847	1,259,432

* this value will deviate from the value provided by the national accounts as we use data of the OECD for taxes on products and not the corresponding value of the national accounts. The difference is rather minor.
Source: Eurostat: Annual sector accounts, own calculations.

2.2.2. Required Rate of Return, Capital Stock, Investment Ratio and Capital Share

Production involves capital input and the required investment and provides compensation (capital compensation) to its owners, including the required rate of return, 'r', and compensation for deprecation of the capital stock. Therefore it is necessary to define some of these values whereas others are determined in the calibration procedure. So one has to define which of these parameters are set and which of them subsequently result from the calibration procedure. Data are available for the capital stock and the level of investment. The required real rate of return is set to 3 percent like in the Quest-model of DG ECFIN. Capital compensation cannot be determined directly from the national accounts as gross operating surplus includes also mixed income which is the remuneration for the work carried out by the owner (or members of his family) of an unincorporated enterprise.

For this reason we suggest the following calibration procedure. We set the capital share, 'isk0', in such a way that it reflects the investment ratio (investment in percent of GDP) in the

data. Using data about the capital stock and the required rate of return the calibration procedure determines the depreciation rate of capital. The capital stock allows to determine the capital depreciation rate in the considered countries by using the following relationship in the steady state (for more information see Modelling of Labour Markets in the European Union – Final Report Part II, p. 37), where 'K' is used to determine the marginal productivity of capital, F_K^Y:

$$F_K^Y = \frac{(1 - t^{prof} sub^i)(r + \delta^K) - t^{prof} \delta^K}{(1 - t^{prof})} - t^{cap}$$

One has to take into account that the capital stock as well as depreciation of capital cannot be observed directly. Both are determined in an indirect way and the calculated values are only approximations to the true values such that adjustments can be justified.

Data about the capital stock in the economy in the calibrated countries is based on the OECD. The OECD Structural Analysis (STAN) database provides information about the net capital stock for the total industries in volumes for a longer time horizon.[2] In contrast to the gross capital stock, the net capital stock takes into account investment as well as depreciation of capital. The gross capital stock neglects depreciation and is therefore no good measure for the available capital in the economy. As the database contains data only for the total industries, investment of private households in residential structures are not included.However, this type of investment will not enter the production function. As capital stock data are only available in volumes but not at current prices we relate the capital stock data to the value added in volumes instead of current prices. Value added in volumes for the relevant countries is also available in the STAN database. A disadvantage of the database is that data are not available for all countries up to the year 2009. For Poland, for example, the latest available information is for the year 2006. For this reason we calculate the average of the shares of net capital stock to gross value added from 2001 onwards to the most recent data. The average share for the countries can be found in the first column in Table 3.

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[2] Information about the capital stock in Slovakia is not available.

Table 3: Capital Stock in Percent of GVA (Average 2001-2009)

	Capital stock as percent of GVA (average 2001-2009) – OECD STAN database	*Capital stock as percent of GVA in LMM*
Austria	374%	374%
Belgium	303%	303%
Czech Republic	448%	448%
Germany	347%	347%
Denmark	347%	347%
*Spain**	438%	438%
Finland	299%	299%
*France***	321%	321%
Italy	355%	355%
*Netherlands***	349%	349%
*Poland****	213%	300%
*Sweden**	258%	258%
Slovakia	n/a	455%
*United Kingdom***	248%	248%

* latest available data for the year 2007, ** latest available data for the year 2008, *** latest available data for the year 2006.
Source: OECD: STAN database, own calculations.

The second column provides the ratio of the capital stock in percent of GVA for the different countries which is used in LMM. For nearly all countries we applied the values provided by the OECD, for Poland we deviate and for Slovakia no value is available. We increased the capital stock in Poland as the level of investment over a horizon of the last ten years, suggests that the capital stock may be higher than the reported level of 213 percent of GVA (see Table 4). As the investment ratio is very similar to the level in Belgium, France, Finland and Italy we decided to set it to 300 percent of GVA. In Slovakia the investment ratio is slightly higher than the one in the Czech Republic. For this reason we set the capital stock in percent of GVA close to the value of the Czech Republic. The capital stock is rather high in the Czech Republic, Spain and Slovakia and significantly lower than the average in Sweden and the UK.

The investment ratio is calculated as the level of investment as percent of GDP. The information is based on national accounts. We use the average investment ratio of the period

2001 up to 2009. The average level for the different countries can be found in Table 4. The rather low capital stock in Sweden and the UK is also reflected in the comparably low investment ratio. However, there is no direct relationship between the investment ratio and level of the capital as the depreciation rate can vary widely as a matter of the different composition of the capital stock (buildings, machinery etc.). The depreciation rate in the modelled countries is derived in the calibration procedure and does not need to be set.

Table 4: Average Investment Ratio (2001-2009)

	Investment ratio (average 2001-2009)
Austria	22.5%
Belgium	21.3%
Czech Republic	26.6%
Germany	17.8%
Denmark	20.7%
Spain	28.2%
Finland	20.7%
France	20.0%
Italy	20.8%
Netherlands	19.8%
Poland	20.8%
Sweden	18.1%
Slovakia	26.8%
United Kingdom	16.8%

Source: Eurostat.

2.2.3. Subsidies on Production

Subsidies are not only paid on products but also in production. The annual national accounts contain data about these types of subsidies and are labelled by d.39. In the model, subsidies on production are assumed to be transfers to firms. From an economic point of view, the higher the subsidies on production the less capital in production needs to earn to yield the required rate of return on capital which is determined on the capital markets. The share of subsidies on gross value added ranges from 0.24 percent in the UK to 1.81 percent in Denmark (see Table 5).

Table 5: Subsidies on Production in Percent of GVA (Average 2004-2009)

	Subsidies on production as percent of GVA (Average 2004-2009)
Austria	1.78%
Belgium	1.33%
Czech Republic	0.94%
Germany	1.06%
Denmark	1.81%
Spain	0.65%
Finland	1.12%
France	1.02%
Italy	0.35%
Netherlands	0.77%
Poland	0.34%
Sweden	1.13%
Slovakia	0.81%
United Kingdom	0.24%

Source: Eurostat: Annual sector accounts, own calculations.

2.3. Demography and Skill Structure

The model includes a detailed breakdown of the population with respect to age and skill, so that we can analyse both age- and skill-dependent effects of policy reforms, as also indicated in the model application, Section 4.

Our model distinguishes three different skill groups. The low-skilled group includes individuals with pre-primary, primary and lower secondary education (ISCED 0-2), individuals with completed tertiary education (ISCED 5-6) are high-skilled and medium-skilled individuals have an upper secondary (and post-secondary non-tertiary) level of education (ISCED 3-4). The distribution of the 25 to 64 years old population according to the highest level of education attained is taken from Eurostat and is shown in Table 8. According to Eurostat, the share of low-skilled individuals ranges from less than 10 percent in the Czech Republic and the Slovak Republic to nearly 50 percent in Spain and Italy. On the other hand, the share of high-skilled individuals ranges from around 15 percent in Italy, the Czech Republic and the Slovak Republic to 37 percent in Finland.

Table 6: Distribution of Educational Groups (in percent), 2009

	Low ISCED 0-2	Medium ISCED 3-4	High ISCED 5-6
Austria	18.1	62.8	19.0
Belgium	29.4	37.2	33.4
Czech Republic	8.6	75.9	15.6
Germany	14.5	59.1	26.4
Denmark	23.7	42.0	34.3
Spain	48.5	21.8	29.7
Finland	18.0	44.7	37.3
France	29.6	41.7	28.7
Italy	45.7	39.8	14.5
Netherlands	26.6	40.6	32.8
Poland	12.0	66.8	21.2
Sweden	19.3	47.7	33.1
Slovak Republic	9.1	75.2	15.8
United Kingdom	25.4	41.2	33.4

Source: LFS, Eurostat, own calculations.

The model is calibrated to an initial steady state that also assumes a stationary demographic structure. Hence, the demographic structure of the population in the model deviates from the actual demographic structure. Our approach is that we take current mortality rates for each one-year-cohort from Eurostat and derive average mortality rates for our age groups. Table 3 compares the actual demographic structure with the demographic structure of the model. We overestimate the group of older individuals in all countries. However, given that we adjust the flat pension in order to derive actual pension expenditures in the countries, this should not be a major problem (see Section 2.12).

Table 7: Demographic Age Profile (in Percent of Individuals Aged 15 and Older), 2009

		15-39	*40-64*	*65+*
Austria	Model	38.0	35.0	27.0
	Data	38.6	40.9	20.5
Belgium	Model	38.2	36.5	25.3
	Data	38.5	40.9	20.5
Czech Republic	Model	40.1	37.5	22.4
	Data	43.0	39.7	17.3
Germany	Model	38.2	34.9	26.9
	Data	34.8	41.6	23.6
Denmark	Model	39.1	36.8	24.2
	Data	38.2	42.3	19.4
Spain	Model	37.2	35.7	27.1
	Data	42.3	38.2	19.5
Finland	Model	38.2	36.6	25.2
	Data	37.1	42.8	20.1
France	Model	37.3	35.9	26.8
	Data	39.4	40.3	20.3
Italy*	Model	37.2	35.4	27.3
	Data	36.5	40.1	23.4
Netherlands	Model	37.9	36.7	25.5
	Data	38.7	43.1	18.2
Poland	Model	40.9	37.5	21.6
	Data	44.8	39.3	15.9
Sweden	Model	37.5	36.1	26.4
	Data	38.8	39.8	21.3
Slovak Republic	Model	41.4	37.8	20.8
	Data	46.6	39.1	14.3
United Kingdom	Model	38.0	36.2	25.8
	Data	40.4	39.9	19.7

* 2008 data for Italy.
Source: LFS, Eurostat, own calculations.

2.4. Consumption Profile

The decisions of individuals determine an optimal marginal propensity to consume ('mpc') out of expected total lifetime wealth. In principle, together with the stream of income and

transfers of the households, the 'mpc' determines the optimal intertemporal consumption profile of individuals in economic models. However, the 'mpc' will deviate from the consumption profile observed in reality. We therefore introduce inter-vivo transfers between households in order to get reasonable consumption-profiles. We calibrate the transfers so that the actual consumption profile results from optimal household behaviour. Data on private consumption expenditures per adult equivalent for different age groups are taken from Eurostat. The dataset contains few data on very young and very old households and the detailed breakdown according to the age was not available for the Czech Republic, Italy and Poland. For these two reasons, we estimate quadratic consumption profiles for all the countries. As can be seen in Table 8, an ordinary least squares estimation shows the expected hump-shaped consumption profile for all countries except for Poland. The hump-shape is more pronounced for some countries such as Germany than for other countries such as Belgium. Given calibrated values for income and transfers and the consumption profile, the asset profile is endogenously determined as a result of the intertemporal budget constraint of private households.

Table 8: Consumption Profile

Country/Age	15-19	20-24	25-39	40-54	55-69	70-79	80-84	85+
Austria	0.83	1	1.17	1.29	1.22	1.03	0.85	0.69
Belgium	0.97	1	1.02	1.04	1.01	0.97	0.93	0.90
Czech Republic	0.97	1	1.02	1.01	0.95	0.87	0.80	0.74
Germany	0.75	1	1.27	1.51	1.55	1.43	1.29	1.15
Denmark	0.84	1	1.17	1.30	1.28	1.15	1.02	0.89
Spain	0.91	1	1.09	1.14	1.10	0.99	0.89	0.80
Finland	0.83	1	1.17	1.29	1.22	1.03	0.86	0.70
France	0.86	1	1.14	1.24	1.21	1.08	0.96	0.85
Italy	0.96	1	1.03	1.03	0.95	0.84	0.75	0.67
Netherlands	0.84	1	1.16	1.27	1.22	1.06	0.91	0.77
Poland	1.01	1	0.99	0.98	0.98	1.00	1.01	1.02
Sweden	0.82	1	1.19	1.36	1.35	1.23	1.10	0.97
Slovak Republic	0.91	1	1.08	1.11	1.03	0.88	0.76	0.65
United Kingdom	0.81	1	1.20	1.34	1.30	1.12	0.95	0.80

Source: Eurostat, own calculations.

2.5. Public Health Expenditures

Information on public health expenditures are received from the OECD Health Database. According to our calculations, public health expenditures range from around 5 percent of value added in Poland to more than 9 percent of value added in France.

Table 9: Public Health Expenditures as a Share of GVA (average 2001-2008)

Country		*Country*	
Austria	8.7	*France*	9.6
Belgium	8.2*	*Italy*	7.3
Czech Republic	6.9	*The Netherlands*	6.7
Germany	9.2	*Poland*	5.1
Denmark	9.2**	*Sweden*	8.5
Spain	6.4	*Slovak Republic*	5.8
Finland	6.9	*United Kingdom*	7.3

* average 2003-2008 for BE; **average 2001-2007 for DK.
Source: OECD Health Data, own calculations.

2.6. Structure of Taxes and Social Security Contributions

Public revenues from taxation and social security contributions in the different countries are derived by using detailed data from the OECD database which is connected to OECD's Revenue Statistics (see e.g. OECD (2010a)). We group the detailed items according to their economic function in seven categories: Income, Capital Gains, Corporates, Social Security Contributions, Consumption, Capital and Other.

It is understood, that the data shown in Figure 1 may deviate sharply from the OECD Revenue Statistics because some items (such as occupational pension schemes) are included in the labour market model but not in the Revenue Statistics. Section 5.3.4 provides information on these adjustments that might be relevant for the modelling experts of the European Commission.

The share of 'total revenues as in the LMM' (including revenues from taxation and social security contributions and the additional items mentioned above) on gross value added ranges from 34 percent in Slovakia to more than 60 percent in Denmark. While the share of income taxes and social security contributions varies widely for the Member States, the difference is less pronounced for consumption taxes.

Figure 1: 'Total Revenues as in the LMM' According to Economic Function, as Share of Gross Value Added, Average 2004-2009
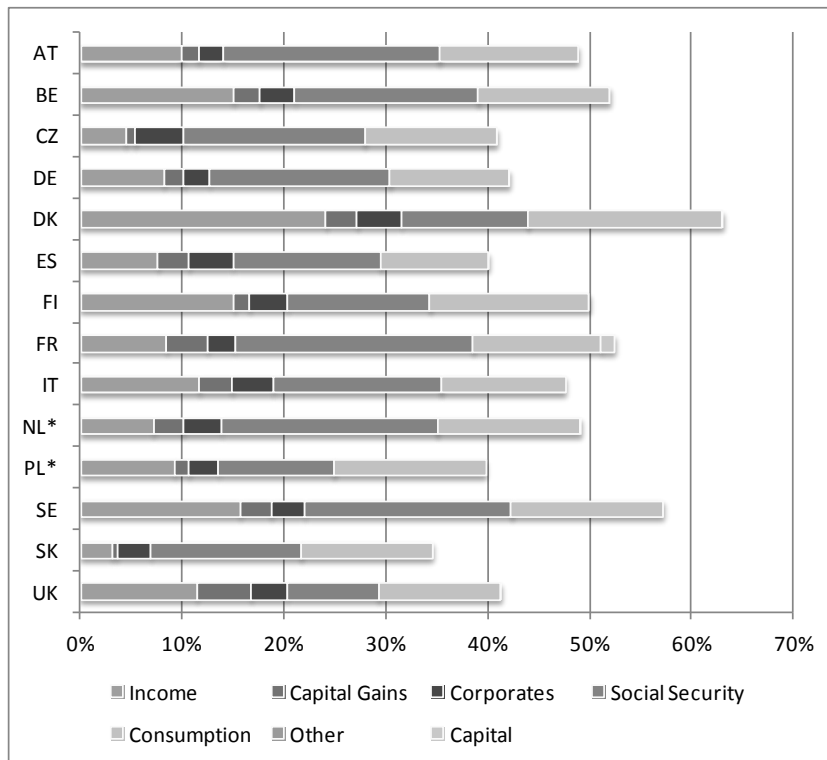
* data only available until 2008.

Numbers shown in the figure may deviate sharply from revenues published in the OECD revenue statistics as some items (such as occupational pension systems) are included in the labour market model but are not included in the Revenue Statistics.

Source: OECD Database, own calculations.

Total 'Model-Revenues' in the different categories are used to calibrate tax rates in the LMM. Most tax rates (e.g. tax on consumption and capital gains tax) are calculated directly by relating revenues to the assessment base (i.e. private consumption or capital gains) and revenues, e.g. the consumption tax rate is equal to revenues from taxes on consumption divided by an appropriate level[3] of consumption. The method described in Section 9.2.3 of the second part of the Final Report of 'Modelling of Labour Markets in the European Union' allows us to derive an age- and skill structure for income tax rates and social security contribution rates of employers and employees according to education and age. These rates are adjusted for all groups so that we get appropriate revenues (only minor adjustments for all countries). For corporate taxation a different method is applied and we used the calculations of Devereux et al. (2009), see Section 2.8. However, we calibrate the necessary deductions of the tax base so that revenues in our model fit to revenues based on OECD data.

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[3] The appropriate level consists of total private consumption as well as shares of public consumption (intermediate consumption and consumption of fixed capital).

2.7. Income Taxation and Social Security Contributions

An important strength of the model is the detailed breakdown of households according to age and skill groups. This enables the authors to determine different tax and social security contribution rates for different groups, so that, for example, progressive income tax systems or maximum thresholds for social security contributions can be replicated in sufficient detail. The drawback of this detailed representation is the additional effort on the calibration of the model. For instance, in models with only one representative household group the tax rates can be calibrated rather easily by using aggregate revenue data. As described in the Final Report of 'Modelling of Labour Markets in the European Union', our method of calculating these age- and skill specific rates relies on a sophisticated application of the Tax-Benefit model of the OECD (using institutional details based on the year 2009) on EU-SILC data.[4] This method is rather time-consuming. However, once the calculation method is working, tax and social security reforms can be replicated rather easily and in profound detail.

This chapter gives a very brief overview on the institutional design of personal income taxes and social security contributions in the different countries. The information is mainly drawn from editions of Taxing Wages (OECD), Benefits and Wages (OECD), the MISSOC database and, if necessary, national sources. Contact to national experts was also very helpful. Section 5.3.5 in the Appendix provides some specific information that might be relevant for modelling experts of the European Commission.

Austria

In Austria, each person is taxed separately, but some of the tax reliefs and tax credits, such as children tax credits and sole earner's or sole parent's tax credits, depend on the marital status of the individual and the number of children. Standard tax reliefs include work related expenses, a minimum allowance for special expenses, child allowances, and, most importantly, employee's social security contributions. Social security (which includes, for example, pension, health and unemployment insurance) is financed by employee's and employer's contributions. Furthermore, payroll taxes are levied on employers with the contributions to the Family Burden Equalisation (4.5 percent) and the Community Tax (3 percent) being the most important ones. Pension payments are subject to the same personal income tax schedule, but social security contributions are lower. Unemployment insurance benefits and unemployment assistance are defined proportional to after-tax income and thus are not taxable.

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[4] In contrast to the previous project, employer's social security contributions have also been extracted from the OECD Tax-Benefit model directly.

Belgium

Spouses are taxed separately in Belgium. However, a notional amount of income can be transferred between spouses if one of them earns no more than 30 percent of the couple's combined income.[5] Individuals can deduct some work-related expenses and, in general, social security contributions. The labour market model also considers the local government tax. Employees and employers contribute to several different items of social insurance (such as unemployment, health insurance, health care, pensions, child care, etc.). A reduction of employer's and employee's social security contributions as well as tax credits are also taken into account in the model. Unemployment and pension benefits are subject to income taxation and to social security contributions amounting to 6.5 percent and 3.55 percent.

Czech Republic

Spouses are taxed separately in the Czech Republic, but some tax credits are dependent on the family status and the number of children. A possibility of joint taxation was introduced in 2005, but it has been abolished in 2008. There are some non-standard tax reliefs such as for supplementary pension scheme contributions and private life insurance premiums. It is important to note that taxable income is comprised of gross earnings, augmented by *employers*' social security contributions (whereas taxable income is comprised of gross earnings minus employees' social security contributions in many other countries).[6] Employees and employers both contribute to health insurance and social insurance. Unemployment benefits are not taxable as well as exempted from social security contributions (as they are already based on previous net labour income). Pension benefits, however, are subject to income taxation but exempted from social security contributions.

Denmark

The income of the individual taxpayer is split into three categories in the Danish personal income tax system: personal income (consisting of employment income, business income, pensions, unemployment benefits, etc.), capital income (e.g. interest payments and dividends) and taxable income (personal plus capital income minus deductions). Spouses are taxed separately, but some unutilised personal allowances can be transferred between them. Work related expenses (e.g. transportation or unemployment premiums) can be fully deducted from wage or salary earnings. Taxable income is subject to a central government income tax, a health care tax, and state and local income taxes. Employees make earnings-independent contributions to unemployment insurance and an early retirement scheme. Furthermore, employees and employers contribute to a Labour Market Supplementary Pension Scheme (the ATP). Additionally, employees pay social security contributions of eight

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[5] This system is called the non-earning spouse allowance or 'quotient conjugal'.

[6] Taxing Wages 2008/09 seems to provide wrong information in this respect. In contrast to that, our information is based on Taxing Wages 2009/10, the Tax-Benefit model and the Taxes in Europe database.

percent of gross earnings. Both unemployment and pension benefits are subject to income taxation and there are no special reliefs for these benefits. Furthermore, unemployment benefits are subject to contributions for the supplementary pension scheme.

Finland

Spouses are taxed separately in Finland. The main reliefs for income taxation include work-related expenses, an earned income tax credit and several non-standard reliefs (such as membership fees or travelling expenses). Municipal taxes account for a major share of income tax revenues in Finland, and we follow the OECD by assuming an average local tax rate of 18.6 percent. Social security contributions are paid by employers and employees. It should be noted, however, that employees' health insurance, pension and unemployment insurance contributions are calculated from different tax bases. Whereas the assessment base for health insurance is taxable income and contributions are therefore not deductible for income taxation, contributions for pension and unemployment insurance are based on gross salary but are deductible for income taxation (see the Appendix for more information). Both, pension benefits and unemployment benefits, are subject to income taxation (with a special treatment for lower pensions) and health insurance contributions.

France

In France, the tax unit is aggregate family income, but children are included only if their parents claim them as dependants. From 2004 on, the law also allows for joint taxation of partners in a French civil union ('PACS'). The 'family quotient' system takes into account the family situation of a taxpayer by dividing net taxable income by a number of shares.[7] In the French income tax system, there are several reliefs such as for work-related expenses, the employment premium ('PPE') or tax credits for low earning households. The universal contribution ('CSG') and the reimbursement of social debt ('CRDS') are assigned to the personal income tax system (and are not seen as social security contributions) in the OECD publications. There are several different types of employees' and employers' social security contributions. Pension benefits are subject to income taxation, to the CSG and the CRDS and to a reduced social security contribution. Unemployment benefits and assistance are subject to income taxation (for details on how CSG, CRDS and social security contributions are levied on these benefits, see chapter 2.11).

Italy

Spouses are taxed separately in Italy, but certain reliefs are dependent on the family status of the individual. Social security contributions due by law can be deducted from taxable income. In 2007, a new tax credit system has replaced the former system of allowances.

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[7] E.g. one share for singles, two shares for couples, and half a share for each dependent child.

Apart from standard tax credits, there are also tax credits for family dependents. Tax credits for children have to be equally shared between the parents. Furthermore, there are regional and local surcharges to the income tax. Using the OECD Tax Benefit model, we apply the tax rate paid in the capital Rome in our model. Employees and employers contribute to the social security system. Old-age pensions and unemployment benefits are subject to taxation and there are no special reliefs for these benefits. In general, social security contributions must be paid only if unemployment benefits replace 80 percent or more of the previous income. Old-age pensions are subject to the very low social security contributions for the National Institution for Italian Pensioners.

Germany

In Germany, spouses are generally assessed jointly, but they also have the option of being assessed separately. We calculate the income tax liability by applying the splitting method: the income tax is calculated on basis of one-half of the joint taxable income and the resulting amount is doubled to obtain the tax liability of the couple. This implies that, even if two partners have a different income, they share the same tax rate which is determined by their joint income. One has to note that this system exclusively applies to married couples and does not include any other form of partnership. Tax allowances include reliefs for children, for lone parents, for work-related expenses and for special expenses. Social security contributions and other expenses for financial security (e.g. life insurance) are deductible up to specific ceilings. A solidarity surcharge that was initially meant to raise money for the reunification is additionally levied on the income tax liability (and on corporate and capital gains taxes). Employers and employees contribute to sickness, pensions, unemployment and care insurance. Retirees pay social security contributions for sickness and care.

The adjustment of the income tax system to subsequent taxation of pension benefits instead of pension contributions leads to several changes. On the one hand, a share of the contributions of workers that is rising over time can be deducted from the income tax base of contributors. On the other hand also the share of pension benefits taxed increases over time for each new cohort changing into retirement. In the year 2005, 50 percent of the benefits were added to taxable income. This share will rise to 80 percent until 2020 and to 100 percent until 2040. Unemployment insurance and unemployment assistance are a proportion of after-tax income and thus are not taxable.

Netherlands

There are three categories of taxable income in the Netherlands but, similar to the Taxing Wages report, here we focus on the category 'taxable income from work and owner-occupied housing'. Spouses are taxed separately in the Netherlands but some tax credits and exemptions are dependent on the family situation. Employees' social security contributions are deductible from taxable income (with the exception of the health insurance contribution)

and there are several non-standard tax reliefs (such as for some travelling and medical expenses or contributions to private pension schemes). Several different tax credits of the Dutch system are implicitly taken into account in the labour market model via a lower income tax rate. Employees and employers contribute to the social security system, see the Appendix for the implementation of this rather complex system in the labour market model. Unemployment and pension benefits are subject to income taxation and social security contributions.

Poland

Married couples can opt to be taxed on their joint income in Poland. In that case, the splitting method system applies, which is similar to the German system. Furthermore, single parents with dependent children are also entitled to use the splitting system. Taxable gross income includes both cash income and the value of benefits in kind. There is a basic tax credit and age dependent reliefs for children. A large part of health insurance contributions and other social security contributions are deductible from taxable income. Social security contributions of employees include contributions to old age, disability and sickness/maternity insurance and the National Health Fund. Employers pay contributions to social insurance (pension and disability payments and an industrial accident fund), to the Labour Fund and the Guaranteed Employee Benefit Fund. Old-age pension, unemployment allowance and early retirement benefits are subject to income taxation and there are no special reliefs for those benefits. Old-age, early retirement and unemployment assistance[8] recipients pay health care insurance.

Slovak Republic

Individuals are taxed separately in the Slovak Republic, but there are some reliefs that depend on the family situation. Apart from that, a basic relief and employees' social security contributions are deductible for income taxation. The employee tax credit is targeted at low-income workers whose wages are subject to social and health insurance. Compulsory social security contributions are paid by employees and employers. In 2005, privately managed fully funded pension pillars have been introduced, which means that 9 percentage points of the employers' contributions are paid to these funds and not to the public social insurance agency for those covered. Unemployment and pension benefits are not taxable and not subject to social security contributions.

Spain

As a general rule, individuals are taxed separately in Spain, but families also have the option of being taxed as married couples or as heads of households. Taxpayers can claim several

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[8] Old-age and invalidity is covered by the public employment system.

standard reliefs such as a basic relief and tax credits depending on the family situation and several non-standard reliefs like subscriptions paid in respect of the trade unions membership. All social security payments are fully deductible. Apart from the central government income tax there is also a substantial regional surcharge. Employees and employers contribute to social security, but the rate of employers (29.9 percent) is substantially higher than that of employees (6.35 percent). Pension benefits are subject to income taxation, but no social security contributions arise. Unemployment insurance benefits are taxable and social security contributions amount to 65 percent of 4.7 percent of reference earnings. Unemployment assistance benefits are tax-free under some conditions, and social security contributions do not arise.

Sweden

Spouses are taxed separately in Sweden. There is a basic allowance that varies with income and there are several non-standard reliefs. Employees are granted a tax credit that is equal to 100 percent of the compulsory social security contributions. There is an Earned Income Tax Credit (EITC) worth up to SEK 18,179 (and even higher for employees aged 65 or more). Apart from the central government income tax, Sweden also has a local government tax. The tax base of this tax is the same and the average rate amounted to 31.5 percent in 2009. Employees and employers pay social security contributions and the rate is reduced for people aged less than 26 (and for some people aged more than 65). Pension benefits, unemployment insurance and assistance benefits are taxable, but no social security contributions are levied.

United Kingdom

In the UK, the tax unit is the individual but, as in many other countries, certain reliefs depend on family circumstances. There is no relief for social security contributions or other taxes. A system of tax credits supports low income groups and provides incentives to participate in the labour market. The Working Tax Credit (WTC) is a non-wastable tax credit given to low income families with or without children and to disabled. The amount depends upon the number of hours worked, the age of children, eligible childcare costs, and gross income. The Child Tax Credit (CTC) is a non-wastable tax credit available to low and middle income families with children. The amount is dependent on gross income and the number and age of children. Employees and employers pay National Insurance contributions and the contribution rate depends on the weekly earnings and whether the employee is contracted out of the state pension scheme. If eligible, members of the National Insurance scheme qualify for pensions, sickness, industrial injury, unemployment benefits, etc. Both unemployment and pension benefits are taxable. Basic State Pension, SERPS pension, State Second Pension and Graduated Retirement Benefits are taxable income, but any increases in respect of dependent children are not. Jobseekers' Allowances are taxable

subject to a certain amount. Both unemployment and pension benefits are not subject to social security contributions.

2.8. Effective Corporate Tax Rates

As source for the corporate tax rate, we use results of Devereux et al. (2009) in a ZEW research report for DG TAXUD of the European Commission. Among other indicators, they provide calculations of the effective marginal corporate tax rate (EMTR) for the relevant countries. Their calculations are based on the method by Devereux and Griffith (2003) which gives EMTRs for a 'mean company'. The EMTRs for the relevant countries are presented in Table 10. There is a wide range for the EMTR in the 14 countries modelled, ranging from -5 percent in Belgium to 35 percent in France.

Table 10: Effective Marginal Corporate Tax Rates, 2009

Country	EMTR (in %)	Country	EMTR (in %)
Austria	17.4	France	34.9
Belgium	-5.1	Italy	20.8
Czech Republic	11.2	The Netherlands	19.6
Germany	21.7	Poland	13.7
Denmark	16.7	Sweden	17.4
Spain	33.4	Slovak Republic	11.3
Finland	18.1	United Kingdom	28.9

Source: Devereux et al. (2009).

2.9. Employment Protection Legislation

A literature review on both theoretical and empirical analysis of EPL can be found in the first part of the final report of the base project, a more detailed description of the calibration in the second part (Berger et al. (2009)). The elasticity of the layoff rate to changes in the economic environment in the model is based on estimates of the OECD (2004). Based on a cross-country GLS estimation, the study finds that the flow into unemployment decreases by 0.165 percentage points if the EPL index increases by 1 point. This estimate is used for the calibration of the sensitivity of the lay off decision of firms. This means that we simulate stricter EPL in the labour market model, which results in a decrease of the flow into unemployment according to the OECD estimate.

Table 11: Overall EPL Index and Share of Severance Pay Costs among Total Firing Costs (2008)

	OECD Index III	*Modified Index*	*Share of Severance Pay*
Austria	2.41	2.37	30.8%
Belgium	2.61	2.36	36.3%
Czech Republic	2.32	2.76	30.1%
Germany	2.63	2.90	35.5%
Denmark	1.91	1.82	23.4%
Spain	3.11	2.88	38.6%
Finland	2.29	2.35	40.5%
France	3.00	2.66	49.3%
Italy	2.58	2.31	38.5%
Netherlands	2.23	2.59	44.8%
Poland	2.41	2.35	23.2%
Sweden	2.06	2.62	34.1%
Slovak Republic	2.13	2.61	42.6%
United Kingdom	1.09	1.41	30.7%

Source: OECD EPL Index (OECD database), own calculations.

Aggregate indicator values for EPL can be found in Table 11. The value of version 3 of the EPL Index of the OECD is shown in the first column.[9] Of the countries modelled, Spain and France feature the highest overall EPL indicator, whereas the value is the lowest for the UK and Denmark. The overall EPL Index is calculated by applying identical weights to the two sub-indices for permanent and temporary employment. In contrast to that, we calculate a *Modified Index* for the labour market model by weighing these two sub-indices by the respective share of permanently and temporarily employed individuals on all employed persons. This modified index is provided in column 2. The difference to the official index is not very large for most of the countries, but we think that this modified index is more appropriate for the model. The labour market model includes both severance payments and administrative firing costs.[10] We calculate the share of severance payments on total firing costs by classifying the costs for the different items of the EPL index according to whether they are associated with severance payments or with administrative costs.

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[9] Compared to version 2, version 3 (which is available from 2008) comprises three additional items related to employment protection.

[10] In principle, the labour market model also includes firing taxes directly paid to the government. However, giving institutional settings in the countries, these firing taxes are set to zero.

As we have more detailed information on firing costs for Germany based on Grund (2003) and Goerke and Pannenberg (2005), the calibration of firing costs in all countries is implemented relative to Germany. We derive the average tenure for each age- and skill-group by using LFS-data for all countries. For Germany, this allows to derive average severance payments for these groups, where values are based on empirical estimates. Assuming that severance payments and administrative costs are proportional to each other in any age- and skill group we derive administrative costs as a multiple of severance payments to the share in Table 11.

For the other countries, lay off costs are set relative to lay off costs for Germany according to the relative value of the modified EPL index. The break down to administrative costs and severance payments in these countries is again based on the value in the last column of Table 11. For sure, this can only be an approximation, but we think that this is a plausible method.

2.10. Public Social Transfers

This section provides an overview of expenditure categories where the data on *public cash* benefits (in percent of gross value added) of the different countries is drawn from the *Social Expenditure* dataset of the OECD. In the following sub-chapters we additionally use other data sources, mainly EU-SILC, for the calibration of total expenditures which might deviate from the values presented here. The EU-SILC allows to determine an age- and skill-dependent pattern for the different expenditure categories. The OECD dataset does not contain information about transfer payments granted for educational attainment which are included in the EU-SILC.

Public cash benefits for the different countries are presented in Table 12. The Table does not include public benefits in kind and transfers based on mandatory private social security institutions. In all countries under study, the most important categories are pension benefits even in those countries where the private pillar plays an important role in the pension system. Expenditures for public pension benefits range from 8 percent of GVA (the Netherlands, Slovakia and the UK) to more than 16 percent in Italy. The sizeable difference is to a large extent the result of the different role of public and (mandatory) private systems and these differences are the reason why these figures are difficult to compare. Given that the age structure and pension benefits in the model deviate from the actual age structure and actual pension benefits (see Section 2.3 and Section 2.12 for further information) pension expenditures in the model would deviate from the actual pension expenditures. In our approach we adjust flat pension benefits, which have less impact on individual incentives than earnings-related pension benefits, so that public expenditures in the model and actual expenditures correspond. However, total expenditures deviate as we take into account mandatory private systems and occupational pension plans.

Further important categories are family allowances (including parental leave) and unemployment benefits. As for pension benefits there are also sizeable differences in family allowance expenditures across the countries, ranging from 0.5 percent of gross value added in Spain to 2.6 percent in Austria. Country differences can, to some extent, also be explained by different strategies. While some countries prefer cash benefits, others prefer benefits in kind to provide assistance for families with children.

Aggregate expenditures for unemployment benefits are influenced by the level of social security in case of unemployment and to a large extent by the unemployment rate and the average duration of unemployment. In most countries, the replacement rate decreases with the duration of unemployment. Expenditures range from 0.2 to 0.3 percent (in Poland, Slovakia and UK) to 3.2 percent of gross value added in Belgium. Expenditures for income maintenance in percent of gross value added are significantly lower than one percent in most countries and close to this value only in the Netherlands and Denmark.

Table 12: Public Cash Benefits in Different Categories (in percent of Gross Value Added)

	Pension	*Unempl.*	*Paid sick leave*	*Family allowances**	*Income maintenance*
Austria	15.9%	1.1%	0.6%	2.6%	0.2%
Belgium	12.0%	3.2%	0.7%	1.8%	0.4%
Czech Republic	9.5%	0.7%	1.2%	1.4%	0.1%
Germany	12.8%	1.8%	1.4%	1.3%	0.2%
Denmark	10.3%	1.3%	1.5%	1.8%	0.8%
Spain	10.2%	2.4%	1.3%	0.5%	0.1%
Finland	12.4%	1.7%	1.0%	1.8%	0.3%
France	14.7%	1.7%	1.0%	1.5%	0.4%
Italy	16.5%	0.4%	1.0%	0.7%	0.0%
Netherlands	7.9%	1.6%	1.1%	0.7%	0.9%
Poland	15.1%	0.3%	1.1%	1.0%	0.2%
Sweden	11.1%	1.2%	1.4%	1.7%	0.4%
Slovakia	8.0%	0.2%	0.5%	1.7%	0.5%
United Kingdom	8.2%	0.3%	0.2%	2.4%	0.2%

* inclusive parental leave.
Source: OECD, Social Expenditure dataset.

2.11. Unemployment Benefits

An important part of the public social system, which influences the behaviour of economic agents, is the unemployment system. According to economic theory, it leads to positive incentives to participate on the labour market, but negative incentives to search for a job, if a person is unemployed. Furthermore unemployment benefits also influence the wage bargaining process between workers and firms as wages in general will rise as a consequence of higher reservation wages if the replacement rate in the unemployment system increases. Unemployment regulations differ among countries to a wide extent. In this chapter we discuss the differences country by country, where the information is mainly drawn from the OECD Benefits and Wages publication and the MISSOC database. To keep things simple we focus on the regulations of 2009. This decision is based on the fact that the years before 2009, only show slight differences in unemployment treatment. For the calibration of the model, we rely on EU-SILC data as it is not possible to translate institutional regulations one by one into the model. This is due to the fact that institutional regulations do not provide information whether a person is eligible for unemployment payments and about the replacement rate as the rate often depends on the length of the unemployment spell or other important aspects.

Further, this chapter provides information on how the variables which reflect the unemployment system in the model, are calibrated. These variables are 'xi1', 'brepl' and 'b00'. 'xi1' reflects the share of unemployed persons receiving benefits which depend on labour income before unemployment ('earnings-related benefits'). The other individuals either receive no public unemployment benefits or benefits which do not depend on labour income. 'brepl' reflects the gross replacement rate in the public or private mandatory unemployment insurance and/or assistance system. If unemployment insurance benefits as well as assistance benefits depend of prior labour income then 'brepl' reflects both of them and the generosity depends on the shares of persons eligible for unemployment insurance and unemployment assistance (if eligibility differs between these two types, which is usually the case). In general, 'brepl' and 'xi1' are based on EU-SILC data. However, if unemployment insurance is dependent on labour income but unemployment assistance is not, then more information is needed to derive 'xi1' and 'brepl'. This is the case in five of the calibrated countries, namely Germany, Spain, Finland, France and Sweden.

In some countries, unemployment insurance and assistance benefits are independent of labour income ('flat') such that we set 'xi1' and 'brepl' to zero in these cases. 'b00' contains benefits independent from previous labour income, like a flat unemployment benefit or social assistance benefits. Social assistance benefits reflected in 'b00' are not discussed in this chapter and therefore also not included in the values for 'b00'. For this reason the values for 'b00' will differ from the ones which will be found in the 'DataInputXX.xlsx' files. For more information see Section 2.13, dealing with social transfers.

To derive the rate of eligibility and the replacement rate we refer to the variable *unemployment benefits PY090G/N* in the EU-SILC, where *G/N* stands for gross or net. This variable contains the yearly income of a person received from several sources, like full and partial unemployment benefits, early retirement benefits, vocational training allowances, mobility or resettlement benefits, severance payments and other, but excludes family allowances. This income category is broader than required, but no better sources are available. As the income variable represents yearly income we divide it by the number of months spent in unemployment represented by the variable *PL080* to receive monthly income. To get rid of very low and very high benefits (which might, for example, be a result of high severance payments), we set very low benefits equal to zero and high benefits to an upper bound. The lower bound and the upper bound are set by visual inspection of the data. Eligibility for unemployment compensation is derived as the number of persons with months spent in unemployment and receiving positive unemployment benefits in relation to the number of persons with months spent in unemployment. The second type of persons includes therefore the ones with no unemployment benefit receipts.

To derive monthly employee cash or near cash income we divide the income variable *PY010G/N* by the number of months spent in full- or part-time work (*PL070*, *PL072*). The average monthly unemployment benefit payments and the average monthly income for the different age- and skill-groups allow to determine average gross- and net-replacement rates for their unemployment period.

In the following the unemployment systems in the considered countries are discussed. The rate of eligibility for unemployment payments (total of unemployment insurance and unemployment assistance) as well as the gross replacement rate (weighted average of unemployment insurance benefits and assistance benefits as percent of average gross labour income of the respective age- and skill-group) will be presented in each of the country's sections. The latter are compared to important parameters of the system to check for plausibility.

Austria

The Austrian public unemployment system is a compulsory insurance scheme for all employees with a monthly earning of more than the so-called 'Geringfügigkeitsgrenze' (monthly minimum income limit) which amounts to EUR 357.74 (2009). For high-income workers, the upper ceiling taken into account is amounting to EUR 4,020. Self-employed persons can insure themselves voluntarily, for civil servants no such insurance exists. To qualify for unemployment benefits, a person must previously have been in dependent contributory employment for at least one year in the last two years, or 28 weeks in a row in case of a repeated unemployment period. For persons aged below 25, only 26 weeks of employment are necessary to qualify for benefit payments. The duration of eligibility depends on work length and the age of the unemployed persons. It starts from 20 weeks and can be

extended to 52 weeks if the unemployed person is aged 50 or more and was employed for at least 468 weeks in the previous 15 years. For specific active labour market programs even longer periods are possible. After the exhaustion of the eligibility for unemployment insurance benefits, a person qualifies for unemployment assistance if this person is in need, unemployment assistance is granted indefinitely.

Unemployment insurance benefits are based on the average net income in the year before the unemployment spell and amount to 55 percent of this reference income. For low income persons the replacement rate is raised to 60 percent (80 percent in households with dependants) if the reference income is below 55 percent of the supplementary pension amount ('Ausgleichszulagenrichtsatz'). In addition, for each dependent person an extra daily amount of EUR 0.97 is paid. Beneficiaries are allowed to receive work related earnings up to the monthly minimum income limit ('Geringfügigkeitsgrenze') without any consequences for the qualification for unemployment benefits. Unemployment assistance benefits, which are paid after the exhaustion of unemployment insurance benefits, amount to 92 percent of the basic unemployment insurance benefits, or 95 percent for low income groups. Family supplements are also available in the unemployment assistance scheme. Eligibility for unemployment assistance requires that earnings of the spouse do not exceed EUR 488 per month (plus additional EUR 244 for each child).[11] Unemployment insurance as well as unemployment assistance benefits are exempted from income taxation and social security contributions.

In the following, the data from the EU-SILC are presented in Table 13. They show that across all age- and skill-groups eligibility is rather high, so that most of the unemployed persons receive payments. Only for the young low-skilled persons the eligibility rate is lower, which reflects the presence of the required minimum contribution period. The replacement rate seems to be rather moderate, however one has to keep in mind, that no taxes and social security contributions are levied on unemployment benefits as well as on unemployment assistance payments. The much lower rate for older, medium and for high-skilled individuals is also a fact of the tax exemption as well as the upper ceiling in the unemployment insurance.

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[11] For persons aged 50 (55) these limits are twice (three times) as high.

Table 13: Unemployment Benefit Eligibility and Replacement Rate in Austria

	Eligibility				Replacement Rate		
	Low skilled	*Medium skilled*	*High Skilled*		*Low skilled*	*Medium skilled*	*High Skilled*
15-19	57%	-	-	*15-19*	56%	-	-
20-24	82%	87%	-	*20-24*	35%	35%	-
25-39	89%	90%	87%	*25-39*	38%	34%	29%
40-54	94%	91%	87%	*40-54*	43%	32%	22%
55-69	78%	75%	70%	*55-69*	40%	23%	20%

Source: EU-SILC, own calculations.

Belgium

Unemployment insurance in Belgium is compulsory and pays earnings related benefits (lump-sum benefits for young persons), dependent on the family status. The qualifying period depends on the age of the insured persons and lies between 312 working days within the last 18 months and 624 working days within the previous 36 months. The benefit duration of eligibility for unemployment benefits is unlimited as long as an unemployed person provides sufficient search effort for a new job. Accumulation with work-income is possible to a certain extent as long as the activity is *subordinate*. Other income from work reduces benefits proportionally to the number of days worked.

Unemployment insurance benefits are income related with lower and upper ceilings. The lower ceiling for cohabitants with dependents amounts to average daily earnings of EUR 63.33, the upper ceiling to EUR 73.33 (2009). For single persons and cohabitants without dependents the lower ceiling amounts to EUR 53.22 and EUR 39.88 (in 2009), respectively. For long-term unemployed persons (longer than one year), the upper and lower ceilings are below the given values. The replacement rate depends also on the family status and the unemployment duration. In the first year the replacement rate amounts to 60 percent (58 percent for cohabitants without dependents). In the second year the replacement rate is again 60 percent for persons with dependents but 53 percent (40 percent) for singles (for cohabitants without dependents). For young and older workers daily unemployment benefits are defined differently. For young individuals, lump-sum daily benefits are defined, for older workers there exist age supplements. Unemployment benefits are subject to taxation. Social security contributions are 6.5 percent according to collective agreements for monthly income above EUR 1,243.61 (2009, 1,497.94 for persons with dependents).

In Table 14, one can find eligibility and the replacement rate in Belgium. The eligibility rate is very high compared to other countries. One reason for this fact may be the unlimited duration of eligibility for unemployment benefits if a person fulfils the required qualifying period. This will be the reason why for younger persons eligibility is considerably lower. The replacement rate is lower than the above mentioned 50 to 60 percent, which may be the consequence of the rather small difference between lower and higher ceiling. The increase of the replacement rate for older workers can be the effect of the age supplements.

Table 14: Unemployment Benefit Eligibility and Replacement Rate in Belgium

	Eligibility				Replacement Rate		
	Low skilled	Medium skilled	High Skilled		Low skilled	Medium skilled	High Skilled
15-19	41%	-	-	15-19	40%	-	-
20-24	87%	75%	-	20-24	34%	32%	-
25-39	95%	97%	87%	25-39	36%	33%	27%
40-54	96%	97%	95%	40-54	36%	33%	24%
55-69	98%	99%	98%	55-69	42%*	38%	27%

* EU-SILC would suggest a value of 46 percent. We set it to 42 percent as otherwise the increase compared to the 40-54 years old unemployed would be too high. The value of 42 percent corresponds to the same increase compared to the 40-54 years old as for the medium-skilled persons.
Source: EU-SILC, own calculations.

Czech Republic

In the Czech Republic persons qualify for unemployment insurance benefits not only in the case of previous employment but also for example in case of rehabilitation, child care and care for a disabled earner in the household. The necessary period of contributions to the pension scheme amounts to twelve months within the last three years. The entitlement for unemployment benefits ends after five months as long the beneficiaries' age is below 50. For persons older than 50 (55) years, the maximum duration raises to eight (eleven) months.

The benefit ratio amounts to 65 percent of the last net earnings (net of tax and social security contributions) in the first two months, 50 percent in the following two months and 45 percent in the remaining months. During retraining of disabled persons the recipient of benefit receives 60 percent of the last net earnings. The maximum benefit equals 58 percent of the average wage or 65 percent in case of retraining. In periods in which persons receive benefits they are allowed to earn half of the minimum wage without losing any entitlements. Benefits received are not taxable as well as exempted from social security contributions.

In Table 15 eligibility and the replacement rate for the different age- and skill-groups are presented. The eligibility rate is rather low compared to other countries but is very similar to the other New Member States discussed in this study. The low eligibility rate can be explained by the short benefit duration in comparison to other countries. The replacement rate also seems to be rather low, but one has to keep in mind that the unemployment benefits are not taxable and exempted from social security contributions, which implies a low replacement rate as benefits are related to gross labour income. Compared to net income the rate is considerably higher.

Table 15: Unemployment Benefit Eligibility and Replacement Rate in Czech Republic

	Eligibility				*Replacement Rate*		
	Low skilled	*Medium skilled*	*High Skilled*		*Low skilled*	*Medium skilled*	*High Skilled*
15-19	12%	-	-	*15-19*	13%	-	-
20-24	37%	45%	-	*20-24*	25%	21%	-
25-39	30%	49%	57%	*25-39*	21%	20%	17%
40-54	31%	47%	35%	*40-54*	26%	20%	17%
55-69	59%	59%	45%	*55-69*	30%	29%	15%

Source: EU-SILC, own calculations.

Germany

In Germany two types of unemployment benefits are available, unemployment insurance and unemployment benefits II. Unemployment insurance is compulsory and entitlement for benefits lasts between six to 24 months, this depends on the contribution period as well as the age of the beneficiary. For eligibility at least twelve months of contribution to the public unemployment system are necessary and earnings have to exceed EUR 400 per month. The ceiling for the reference income differs between the new and old Länder, amounting to EUR 5,500 for the new and EUR 4,550 for the old Länder in 2009. If a person receives unemployment insurance benefits she/he is allowed to work at most 15 hours per week without consequences. After the expiration of the unemployment benefits, unemployed are eligible for unemployment benefit II. This benefit is a combination of unemployment assistance and social assistance with the aim to increase labour force. Furthermore unemployment benefit II is needs-based and means-tested.

The replacement rate in the unemployment insurance is 60 percent of previous net earnings, or 67 percent for unemployed with at least one dependent child. There is also a ceiling for underlying earnings, which differs between West- and East-Germany. Unemployment

benefits II is a flat rate, independent of former labour income, but dependent on the number of persons in the household and other social factors. It consists of a standard benefit to secure livelihood, additional needs allowances, housing and heating allowance, one-off benefits and insurance contributions. For support of school attendance an additional benefit is paid. The transition from unemployment insurance to unemployment benefit II is cushioned by an allowance which is restricted to two years. The lump-sum standard benefit for a single person amounts to EUR 359 (2009) and between 60 and 80 percent of this value for other household members. Unemployment insurance and unemployment benefits II are exempted from taxation and social security contributions.

The calculation of necessary values for the calibration is a little bit more complicated as the unemployment assistance (unemployment benefits II) is independent of the income level. For this reason also the incentives are different. If replacement income depends on previous labour income, higher wages will induce a higher replacement income, which is not the case for a fixed flat replacement income. For this reason, unemployment benefits are divided into the income dependent unemployment insurance and the income independent unemployment assistance in the model. The same happens for four other countries, Spain, France, Finland and Sweden.

The share of persons receiving unemployment insurance benefits in percent of all unemployed persons is reflected in the policy parameter 'xi1'. The variable 'b00' reflects the income of the other unemployed, including those without benefits eligibility and those who receive unemployment assistance. For this reason, the fewer persons are eligible for unemployment assistance benefits, compared to those who receive them, the lower will be 'b00'. The policy parameter 'brepl', which stands for benefit replacement, captures the gross replacement rate in the unemployment insurance. These inputs are necessary for countries with an income independent unemployment replacement income. For the other countries only values for 'xi1' and 'brepl' are needed as unemployment insurance as well as unemployment assistance are income dependent.

Table 16 provides the calculated values for eligibility for unemployment insurance in Germany for different age and skill-groups, the replacement rate in the unemployment insurance and the average replacement income of persons not eligible for unemployment insurance benefits. The division of unemployed persons into those who receive unemployment insurance and those who receive unemployment assistance or nothing is based on data of the 'Bundesagentur für Arbeit' (Federal Employment Agency), which provides information about unemployment insurance and unemployment assistance for different age groups and educational levels in the annual reports.

The share of unemployed persons receiving unemployment insurance benefits is comparably low, especially for low-skilled persons, for high-skilled unemployed it is markedly higher. In contrast, across the age-groups within the educational groups the difference is

rather small. Long-term unemployment plays an important role in all groups. The replacement rate in the unemployment insurance 'brepl' is calculated by using information about dependents of unemployed persons which can be derived from LFS-data. Using this information 'brepl' is derived as weighted average of 60 percent (for persons with no dependent children) and 67 percent (for persons with dependent children). In the aggregate across the age- and skill-groups the difference is rather minor.

Table 16: Unemployment Benefit Eligibility and Replacement Rate in Germany

	xi1				brepl		
	Low skilled	*Medium skilled*	*High Skilled*		*Low skilled*	*Medium skilled*	*High Skilled*
15-19	13%	-	-	*15-19*	61%	-	-
20-24	19%	39%	-	*20-24*	61%	60%	-
25-39	12%	24%	33%	*25-39*	63%	63%	62%
40-54	12%	26%	38%	*40-54*	63%	63%	63%
55-69	19%	37%	57%	*55-69*	62%	61%	61%

	b00 (as percent of gross income)		
	Low skilled	*Medium skilled*	*High Skilled*
15-19	32%	-	-
20-24	47%	17%	-
25-39	36%	21%	10%
40-54	25%	17%	9%
55-69	25%	12%	5%

Source: Bundesagentur für Arbeit (Federal Employment Agency), EU-SILC, LFS, MISSOC, OECD, own calculations.

Fixed payments from the unemployment assistance are calculated by using information on dependent children living in the household. Information concerning the amount of unemployment benefits II is drawn from MISSOC and OECD Benefits and Wages and relevant information about other social benefits is provided by the Federal Employment Agency. The corresponding nominal values are then related to the average gross labour income in the age- and skill-groups.

Denmark

In contrast to most other European countries, unemployment insurance is voluntary in Denmark and accessible for employees and self-employed persons. Even though the system is voluntary about 90 percent of the workforce participates in the system. Benefits are paid until an age of 65. If the job loss was voluntary the claim for benefits becomes valid after three weeks. 52 weeks of full time work during the last three years prior tounemployment entitles to immediate payment. The benefit for school graduates amounts to 82 percent of the maximum unemployment benefit, for other young persons the benefit amounts to 50 percent of the maximum benefit.

A special scheme exists for older, long-time insured (more than 30 years) workers. They have the possibility to enter early retirement with a ceiling of 91 percent of maximum unemployment benefits. If voluntary retirement is postponed for at least two years and the insured person was employed than the maximum unemployment benefit is paid.

The benefit in the unemployment insurance amounts to 90 percent of earnings received before the unemployment spell, after deduction of eight percent social security contributions. The minimum monthly benefit is about DKK 12,900, the maximum amount is up to DKK 15,700. The bandwidth between minimum and maximum payment is comparable small, in such a rate that unemployment benefits seem to be fairly flat. An unemployment assistance system does not exist in Denmark. Unemployment benefits are subject to taxation with no special relief as well as subject to the contribution to the supplementary pension scheme (ATP).

Table 17 provides the relevant information about eligibility and the replacement rate for the model calibration. It shows that eligibility is very high with the exception of younger persons. This results out of the required qualifying period. The high eligibility rate will also be a fact of the low share of long-term unemployed persons in Denmark. The replacement rate based on EU-SILC calculations shows a much lower replacement rate as the replacement factor of 90 percent would suggest. However, the minimum and maximum amount does strongly influence the result, in that a large share of the unemployed will receive the maximum benefit. In the model, unemployment benefits are reflected in 'b00' instead of 'xi1' and 'brepl' implying that the benefit is modelled as wage independent. The small difference of the minimum and maximum amount of the unemployment benefit justifies this step insofar as for a lot of unemployed individuals the unemployment benefit is rather wage-independent. The value of 'b00' is derived by multiplying eligibility rate by the replacement rate for each age- and skill-group.

Table 17: Unemployment Benefit Eligibility and Replacement Rate in Denmark

	Eligibility				Replacement Rate		
	Low skilled	*Medium skilled*	*High Skilled*		*Low skilled*	*Medium skilled*	*High Skilled*
15-19	45%	-	-	*15-19*	55%	-	-
20-24	66%	76%	-	*20-24*	49%	59%	-
25-39	91%	85%	90%	*25-39*	56%	51%	39%
40-54	87%	86%	92%	*40-54*	48%	46%	39%
55-69	92%	91%	83%	*55-69*	57%	51%	39%

Source: EU-SILC, own calculations.

Spain

The unemployment system in Spain can be characterised as being a system of two types of support, unemployment insurance and unemployment assistance, where the unemployment assistance is granted subsequently to unemployment insurance. In Spain persons who voluntarily quit their employment do not qualifiy for unemployment benefits. Eligibility criteria are a minimum of 360 working days in the six years preceding unemployment. Unemployment insurance benefits are paid at most for 720 days, where the duration depends on the number of days contributed to the system within the last six years. The minimum duration amounts to 120 days, subsequently an unemployed person may qualify for unemployment assistance, this benefit is income-tested. To be eligible other earnings in the household must be below 75 percent of the interprofessional minimum wage. The benefit duration for unemployment assistance is in most cases between six and 18 months. For persons in the age group 52 or older no maximum period exists. Special regulations exist for certain groups and regions.

The unemployment insurance benefit amounts to 70 percent of the reference earnings (average gross earnings over the last 180 days) for the first 180 days and 60 percent afterwards. In addition, there exist minimum and maximum benefits, which are defined as percentage of a defined reference income IPREM.[12] For unemployed persons with no dependent child the minimum amounts to 80 percent, the maximum to 175 percent of the reference income IPREM. For example, two or more children raise the minimum and maximum to 107 and 225 percent. Unemployment assistance amounts to 80 percent of IPREM, but is excluding bonus payment of one sixth. Unemployment insurance benefits are

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[12] For 2009 the reference income (including bonus payment amounting to one sixth) was set to EUR 615.11 per month.

taxable and social security contributions amount to 65 percent of 4.7 percent (contributions for pension/sickness and invalidity insurance) of reference earnings. Unemployment assistance benefits are in general tax-free as long as no other household income exists, and social security contributions do not arise.[13]

Compared to other countries, eligibility for benefits is rather low, but increases significantly with age. The qualifying restrictions and the duration of payments in comparison to other discussed countries cannot explain these differences. Table 18 provides insights on how we calibrated the Spanish unemployment system. A relatively large share of all beneficiaries receives unemployment assistance (about 35 percent in the age group 25 to 54 and two thirds for older workers) such that 'xi1' is even lower. The replacement rate in the unemployment insurance system 'brepl' decreases with the age and skill-group as a result of the maximum benefit like in most other countries. The amount of unemployment assistance income is comparable to other countries, but is an important income especially for older workers as a result of the large share of eligibility.

Table 18: Unemployment Benefit Eligibility and Replacement Rate in Spain

	xi1				brepl		
	Low skilled	*Medium skilled*	*High Skilled*		*Low skilled*	*Medium skilled*	*High Skilled*
15-19	2%	-	-	*15-19*	54%	-	-
20-24	19%	20%	-	*20-24*	60%	55%	-
25-39	30%	29%	25%	*25-39*	51%	53%	49%
40-54	30%	29%	25%	*40-54*	45%	36%	30%
55-69	21%	17%	23%	*55-69*	38%	35%	24%

	b00 (as percent of gross income)		
	Low skilled	*Medium skilled*	*High Skilled*
15-19	1%	-	-
20-24	3%	3%	-
25-39	5%	5%	3%
40-54	7%	5%	3%
55-69	16%	10%	9%

Source: EU-SILC, own calculations.

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[13] Contributions are paid by the Public Service of Public Employment.

Finland

In Finland unemployment insurance consists of two parts, a basic benefit, which is independent of former earnings and an earnings related benefit. The wage related unemployment insurance is a voluntary service so that benefits are only paid to insured persons. In addition to these two parts unemployment assistance (Labour Market Support) is available. It focuses on job seekers entering the labour market the first time as well as persons re-entering the labour market. To qualify for unemployment payments a minimum of 43 weeks of employment (at least 18 hours per week) in the last 28 months has to be fulfilled. For earnings related benefits ten months of voluntary contribution are necessary.

The basic benefit amounts to EUR 25.63 per day (2009), five days per week. The earnings related benefit consists of the basic benefit plus 45 percent of the daily reference earning in excess of the basic benefit up to a reference earning of EUR 107.29 and 20 percent for the part of daily earnings in excess of EUR 107.29. The daily reference earning is measured as gross earning minus employees' social security contributions. In addition to the basic or earnings related benefit a child supplement is granted, which is paid to all unemployed persons in the household.

Unemployed persons are allowed to work 75 percent of full-time hours, where unemployment benefits are reduced by 50 percent of earned gross income. The maximum amount of benefit and part-time income may not exceed 90 percent of the reference earning. The benefit duration is approximately two years.

In case of long-term insured persons (five years contribution to unemployment fund, 20 years pension entitlements) and job loss due to economic and production-related reasons an increased benefit will be paid (55 percent of daily reference earnings above the basic benefit instead of 45 percent and 32.5 percent above EUR 107.29 instead of 20 percent). The increased benefit is not restricted to the limit of 90 percent of the reference earnings but can be as high as the reference earnings. This kind of benefit is only paid for 150 days. The increased benefit can also be applied to unemployed persons who are only receiving the basic benefit, in this case the basic benefit increases by EUR 4.41. The requirement of having contributed to the unemployment fund is not applied in this case. The benefits are taxable, however only health insurance contributions of 1.24 percent are levied upon them, no other social security contributions.[14]

The unemployment assistance scheme, Labour Market Support, is granted for persons not eligible for unemployment insurance benefits and willing to and actively seeking work. In general benefits are subject to an income test, which is suppressed for long-term

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[14] Unemployment and pension contributions of the employee are already deducted for the calculation of the reference earnings.

unemployed persons, who received unemployment insurance before and for older workers. The maximum benefit amounts to the basic benefit in the unemployment insurance plus child supplements.

Finland is one of the five countries with a wage independent unemployment assistance scheme. In addition, the basic benefit is also independent from previous labour income, only income above the first threshold of EUR 25.63 leads to additional income related benefits. Therefore, more information is needed to derive the necessary input for the calibration. For this reason we use information about the labour income from EU-SILC to derive the share of income within the different thresholds for the different age- and skill-groups. Income below the first threshold is assumed to belong to the wage independent part of unemployment benefits 'b00'. Income above the first threshold and below the second threshold is accounted with 45 percent and income above the second threshold with 20 percent. This allows to derive the income dependent replacement rate 'brepl' as stated in Table 19. The calculation takes into account that the yearly reference income is divided by 12.5 months instead of twelve months to derive monthly income and that social security contributions (4.5 percent) are deducted from the reference income. The table shows that the replacement rate is very similar for all age and skill groups. This result depends on two counteracting effects. On the one hand if income rises than a higher share of income will be considered in the calculation of the replacement rate which rises the replacement rate as percent of gross labour income. On the other hand higher income will imply that a larger share of the income will be multiplied by the lower replacement rate of 20 percent which decreases the overall replacement rate. Overall both effects seem to neutralize each other to a large extent.

The policy parameter 'b00' includes the Labour Market Support benefit as well as the basic benefit amount, which is paid to low-income earners and to earnings related benefits. For this reason 'b00' in percent of gross labour income is rather high compared to other countries. In general it increases with age but there seems to be no pattern between the skill-groups as it contains benefits from very different types of persons receiving unemployment benefits.

Table 19: Unemployment Benefit Eligibility and Replacement Rate in Finland

	xi1				*brepl*		
	Low skilled	*Medium skilled*	*High Skilled*		*Low skilled*	*Medium skilled*	*High Skilled*
15-19	0%	-	-	*15-19*	20%	-	-
20-24	10%	16%	-	*20-24*	26%	26%	-
25-39	52%	52%	54%	*25-39*	28%	28%	27%
40-54	60%	62%	62%	*40-54*	28%	28%	26%
55-69	67%	68%	64%	*55-69*	27%	28%	26%

	b00 (as percent of gross income)		
	Low skilled	*Medium skilled*	*High Skilled*
15-19	11%	-	-
20-24	15%	30%	-
25-39	43%	44%	34%
40-54	44%	50%	29%
55-69	76%	66%	36%

Source: EU-SILC, MISSOC database, OECD Benefits and Wages, Official Statistics of Finland, own calculations.

France

Unemployment benefits in France consist of a compulsory unemployment insurance and an unemployment assistance, which is paid subsequently. Unemployment insurance benefits are based on previous labour income, whereas unemployment assistance benefits are lump-sum. The qualifying period for unemployment insurance is six months of employment during the last 22 months. For unemployment assistance five years of activity during the last ten years preceding unemployment are necessary. Unemployment insurance benefits are not means-tested, for assistance benefits ceilings for monthly income exist. The duration for which unemployment insurance benefits are paid is at least seven months, with a maximum of 36 months. Unemployment assistance consists of two different types of payment, the allowance of specific solidarity and the temporary waiting period allowance. The latter is granted at most twelve months, the former six months, both are renewable such that a much longer duration is possible. Benefits are subject to taxation with no special relief scheme. In addition social security contributions have to be paid, consisting of 6.2 percent for the generalised social contribution and 0.5 percent for the contribution for the repayment of

social debt. In case of unemployment assistance these contributions do not arise. Both, benefits and assistance are subject to a supplemental pension contribution of three percent.

The unemployment insurance benefits are the maximum of 40.4 percent of the reference daily wages with additional EUR 10.93 per day and 57.4 percent of the reference daily wage within a limit of 75 percent of the daily wage. Additional the minimum daily benefit amounts to EUR 26.66 per day. The unemployment assistance pays a maximum of EUR 14.74 per day (30 days per month) in case of eligibility for the allowance of specific solidarity or EUR 10.38 per day in case of the temporary waiting period allowance.

Table 20: Unemployment Benefit Eligibility and Replacement Rate in France

	xi1				brepl		
	Low skilled	*Medium skilled*	*High Skilled*		*Low skilled*	*Medium skilled*	*High Skilled*
15-19	14%	-	-	*15-19*	53%	-	-
20-24	27%	38%	-	*20-24*	61%	53%	-
25-39	33%	43%	43%	*25-39*	58%	61%	53%
40-54	27%	36%	33%	*40-54*	66%	63%	61%
55-69	35%	41%	40%	*55-69*	78%	61%	61%

	b00 (as percent of gross income)		
	Low skilled	*Medium skilled*	*High Skilled*
15-19	2%	-	-
20-24	6%	7%	-
25-39	10%	12%	7%
40-54	12%	12%	7%
55-69	16%	12%	7%

Source: EU-SILC, LFS, own calculations.

France belongs to the group of countries with a non-income dependent unemployment assistance scheme which requires the calculation of 'b00'. To derive the share of persons receiving unemployment assistance benefits of all persons receiving benefits we use the share of long-term unemployed on all unemployed persons, defined as being unemployed for more than one year. Using EUR 14.74 per day or EUR 435.30 per month as basis for unemployment assistance benefits this allows to calculate 'b00' by taking into account the share of unemployed without any unemployment claims on all unemployed individuals. The

relatively low level of 'b00' across all age- and skill-groups is also a matter of the comparable low share of unemployed persons with unemployment benefit claims, although it is much higher than in the New Member States. The policy parameter 'xi1' is derived by using EU-SILC information about eligibility and the share of short time (less than one year) unemployed persons. The replacement rate in the unemployment insurance 'brepl' is calculated by using the average replacement rate of all persons receiving unemployment benefits, 'b00' and the according shares for unemployment insurance and unemployment assistance. The replacement rate fits very well to the statutory replacement rate of at least 57.4 percent and is very similar across age and skill-groups. The values are presented in Table 20.

Italy

In Italy unemployment insurance is a compulsory scheme, unemployment assistance does not exist. There are three main types of unemployment benefits, which are not means-tested: i) ordinary unemployment benefits, ii) wage supplementation funds (Cassa Integrazione Guadagni - CIG) and iii) mobility benefits. Ordinary unemployment benefits are paid to workers who are individually or collectively laid off and are not eligible for other benefits. To be eligible for unemployment benefits individuals are required to have paid contributions for 52 weeks within a two year period (there also exist reduced requirements). The CIG supplements salaries if an enterprise changes to short-time work on its own or due to sector or area specific firm restructuring. CIGs are not available for workers of small manufacturing firms (less than 15 employees) and most service activities. To be eligible, CIG workers must have some form of ongoing work relationship with the employer. Mobility benefits are mostly provided in cases of collective dismissals if the workers are already eligible for CIGs. Workers receiving CIGs and mobility benefits are eligible for welfare work for 12 months in general. Long-term unemployed persons (more than two years) without income support are also eligible for the welfare work.

CIGs are normally granted for 13 weeks in case of activity reduction in a single firm, although a prolongation is possible. In case of an area or sector wide activity reduction benefits are normally paid between twelve and 24 months. The duration of mobility benefits depends on age and region and lies between twelve and 48 months.

Benefits are calculated on basis of average remuneration during the last three months before unemployment. In the ordinary unemployment benefit scheme the replacement rate is 60 percent for the first six months and 50 percent for the following two months for a person under 50 years. In addition, persons aged 50 or older receive a benefit of 40 percent after those eight months. The monthly maximum of benefit is EUR 886.31 (EUR 1,065.26) per month for earnings below (above) EUR 1,917.48. CIGs amount to 80 percent of average gross earnings for non-worked hours with a maximum level of benefit equal to the ordinary benefit. In the construction sector the maximum amount is 20 percent higher. Mobility

benefits equal CIGs in the first year and are 20 percent lower afterwards. All benefits are taxable where in general social security contributions must be paid only if benefits replace 80 percent or more of the previous income.

Eligibility for unemployment benefits and the replacement rates for the different age- and skill-groups in Italy can be found in Table 21. Compared to other countries eligibility for unemployment benefits is low and increasing with age (with the exception of the last age group). Given the maximum benefit criteria the replacement rate is considerably lower than the statutory replacement rate of 60 percent (50 percent after 6 months). For this reason the replacement rate also decreases with the level of education.

Table 21: Unemployment Benefit Eligibility and Replacement Rate in Italy

	Eligibility				Replacement Rate		
	Low skilled	*Medium skilled*	*High Skilled*		*Low skilled*	*Medium skilled*	*High Skilled*
15-19	2%	-	-	*15-19*	35%	-	-
20-24	16%	14%	-	*20-24*	28%	24%	-
25-39	27%	27%	25%	*25-39*	37%	37%	28%
40-54	33%	33%	41%	*40-54*	35%	32%	26%
55-69	24%	16%	26%	*55-69*	35%	37%	24%

Source: EU-SILC, own calculations.

Netherlands

Unemployment insurance benefits in the Netherlands are earnings-related and the insurance is compulsory for employees, unemployment assistance is not available. Supplementary benefits may be granted if the replacement income is below the minimum income. For eligibility a person must have worked 26 weeks within the last 36 weeks and additionally 52 days in four of the last five years. Child-care activities for children under six years are accounted to a certain extent. Benefit duration depends on the employment duration before unemployment. For up to three years of employment, benefits are paid for three months, for a longer employment history the maximum benefit period corresponds to the number of years of employment. Benefits stop with the retirement age of 65. As the replacement ratio is based on gross income, unemployment benefits are taxable and social security contributions are deducted.

The replacement rate in the unemployment insurance amounts to 75 percent of the former gross earnings in the first three months (at most) and 70 percent in the following months up

to a maximum of the daily wage of EUR 183.15. In addition the benefits amount to at least a certain fraction of the gross minimum wage per month plus the holiday pay of eight percent as long as the total income of a beneficiary and his or her partner is less than the minimum guaranteed income. For a single person the fraction amounts to 70 percent, for lone parents 90 percent and for married persons and couples the benefit corresponds to the full amount. At certain circumstances, for younger persons the supplementary benefits are not available.

Table 22: Unemployment Benefit Eligibility and Replacement Rate in the Netherlands

	Eligibility				Replacement Rate		
	Low skilled	*Medium skilled*	*High Skilled*		*Low skilled*	*Medium skilled*	*High Skilled*
15-19	34%	-	-	*15-19*	70%	-	-
20-24	43%	53%	-	*20-24*	69%	84%	-
25-39	33%	51%	55%	*25-39*	66%	71%	67%
40-54	38%	49%	56%	*40-54*	62%	59%	43%
55-69	33%	57%	49%	*55-69*	62%	61%	44%

Source: EU-SILC, own calculations.

Compared to many other EU-15 countries eligibility is rather low, as Table 22 shows. This modest rate may be a fact of the dependence of benefit duration on the number of years in employment. However, this does not explain why the rate of older workers is not considerably higher. One reason may be the absence of an unemployment assistance scheme. The replacement rate fits very well to the statutory replacement rate taking into account the maximum benefit. It decreases with age as income rises and with the skill-level which also implies a higher labour income.

Poland

Poland has a compulsory insurance scheme that provides a flat-rate benefit, but no unemployment assistance. Persons are eligible if they are ready to work, at least 18 years old and have not reached retirement age. To qualify an unemployed must have been employed for at least 365 days during the 18 months preceding the day of registration. There is a means-test that is confined to the individual applicant. Maximum benefit duration depends on the unemployment rate in the region, the number of eligibility periods and family circumstances and ranges from six to twelve months. Benefit recipients are not allowed to receive income in excess of 50 percent of the minimum gross remuneration.

If qualified for benefits, an unemployed person receives a benefit that is paid monthly as a percentage of the 'Basic Unemployment Allowance', which was PLN 575 (June 2009). Persons having less than five years of unemployment benefit eligibility period receive 80 percent of that benefit, persons with five to 20 years receive 100 percent and persons having more than 20 years receive 120 percent of that amount. Health insurance contributions (nine percent) and income tax have to be deducted from the benefits. Old-age and disability pension insurance are covered by the public employment service. For certain groups of people at special situations, namely young persons, long term unemployed, persons aged over 50, low-skilled unemployed, lone parents, unemployed after imprisonment and people with disabilities, alternative regulations are applied.

Table 23: Unemployment Benefit Eligibility and Replacement Rate in Poland

	Eligibility				Replacement Rate		
	Low skilled	*Medium skilled*	*High Skilled*		*Low skilled*	*Medium skilled*	*High Skilled*
15-19	2%	-	-	*15-19*	72%	-	-
20-24	4%	13%	-	*20-24*	40%	33%	-
25-39	8%	17%	17%	*25-39*	32%	25%	17%
40-54	13%	21%	22%	*40-54*	37%	26%	15%
55-69	20%	31%	35%	*55-69*	46%	33%	17%

Source: EU-SILC, own calculations.

Table 23 provides the results from the calculations based on EU-SILC data. As in the other New Member States covered by this report, eligibility for unemployment benefits is low, especially for younger workers, with less than 20 percent of the unemployed persons. The share rises with age and the educational level. This may be a result of the rather strong qualifying condition of being employed for 365 days in the last 18 months. In addition there is a means test, which is not the case in many other countries. Also benefit duration is modest with 6 to 12 months. This explains the numbers in the first part of Table 23. As payment is wage independent one can expect that the replacement rate decreases with the level of income which in general implies a decrease with age and education. Based on EU-SILC one finds that the replacement rate declines along these two dimensions (with the exception of the last age group, where special regulations may explain the increase of the rate). As unemployment benefits are wage-independent they are represented in the model in the variable 'b00' instead of 'xi1' and 'brepl'. The value of 'b00' is derived by multiplying the eligibility rate by the replacement rate for each age- and skill-group.

Sweden

The unemployment system in Sweden is based on an income related and voluntary unemployment insurance scheme and a flat-rate unemployment assistance. For unemployment insurance a beneficiary must have worked at least 6 months (with at least 80 hours per month) or 480 hours during a continuous period of 6 months (with at least 50 hours each month). In addition, an insured person (employee or self-employed) must be a member of the 'Unemployment Insurance Society' for at least during the last 12 months. The duration of benefits is a minimum of 300 days (450 for persons with dependent children). If the job-loss is voluntary, a waiting period of 45 days is applied. After the expiration of the benefit, an unemployed person can take part in an active labour market programme or in the job and development guarantee for additional 450 days. Unemployment assistance is available for persons with short insurance periods who meet the employment conditions and are 20 years or older. The duration is again 300 days, or 450 days with dependent children.

The gross replacement rate in the unemployment insurance amounts to 80 percent of previous earnings for the first 200 days and 70 percent afterwards. There are also maximum and minimum daily benefits (SEK 680 and SEK 320). The benefit is reduced proportionally if the person worked fewer days before unemployment. The job and development guarantee pays 65 percent of previous earnings with the same limits. Benefits in the unemployment assistance correspond to a daily flat-rate benefit of SEK 320, the minimum payment in the unemployment insurance scheme. For part-time workers the benefit is reduced proportionally. Unemployment insurance and assistance benefits are taxable, but no social security contributions are deducted.

Sweden is the last of the five countries of all discussed countries with labour income independent unemployment assistance but wage dependent unemployment insurance benefits. Although unemployment insurance is voluntary, eligibility for this type of benefit is rather high and stable for the age group 25 to 69 years old, as stated in Table 24. For younger persons the eligibility is markedly lower. The share of persons with unemployment insurance is derived as share of short-term unemployed (less than one year) on all unemployed individuals receiving benefits by using information of the LFS. Similar to eligibility, the replacement rate 'brepl' is constant for unemployed aged 25 and above and lower for younger low-skilled persons. The decrease in the replacement rate with respect to the level of education can be attributed to the maximum benefit level.

The level of the fixed unemployed assistance is calculated by dividing the monthly replacement income of SEK 6,930 by average gross labour income in the different age- and skill-groups. In this calculation also the average number of hours worked in the different groups is taken into account as unemployment assistance depends on the number of hours worked before unemployment. In addition, as also unemployed individuals without any

benefits are considered in this calculation with a replacement income of zero, 'b00' is very low.

Table 24: Unemployment Benefit Eligibility and Replacement Rate in Sweden

	xi1				brepl		
	Low skilled	*Medium skilled*	*High Skilled*		*Low skilled*	*Medium skilled*	*High Skilled*
15-19	2%	-	-	*15-19*	41%	-	-
20-24	23%	31%	-	*20-24*	41%	59%	-
25-39	38%	46%	42%	*25-39*	60%	59%	44%
40-54	31%	43%	42%	*40-54*	54%	55%	44%
55-69	45%	41%	39%	*55-69*	62%	60%	45%

	b00 (as percent of gross income)		
	Low skilled	*Medium skilled*	*High Skilled*
15-19	0%	-	-
20-24	2%	2%	-
25-39	5%	5%	3%
40-54	4%	7%	5%
55-69	9%	11%	7%

Source: EU-SILC, LFS, MISSOC, OECD Benefits and Wages, own calculations.

Slovakia

Unemployment insurance is mandatory for employees and voluntary for self-employed persons. Unemployment insurance is also mandatory for part-time employees. There are no special rules conditioning on age or family status, rules are also identical regardless the reason for the job loss of an employee (voluntarily or laid-off). An insured person is eligible for payments if she or he was insured for at least three (two for seasonal workers) years within the last four years. The benefit duration amounts to 6 months (4 months for seasonal workers).

Unemployment insurance benefits amount to 50 percent of gross labour income in the contribution period. Benefits are restricted by the maximum assessment base, which is defined as four times lagged average earnings. In addition, there are several benefits paid

for persons participating in active labour market policy measures. The benefits are not taxable as well as free of social security contributions.

Table 25 contains the relevant information for the calibration of unemployment benefits in Slovakia. Again eligibility is comparably low like in the other New Member States. One important reason is the short period of benefit duration with six months and no subsequent unemployment assistance period. The qualifying condition may imply the low eligibility of young workers. The replacement rate lies somewhat below the statutory rate of 50 percent and decreases with the level of education. The replacement rate for the 55 to 69 year old individuals is adjusted by setting it to the same level as for the 40 to 54 years old. The reason is the rather low sample size which led to rather implausible values for the replacement rate. We do the same for the eligibility rate of the 55 to 69 years old high-skilled.

Table 25: Unemployment Benefit Eligibility and Replacement Rate in Slovakia

	Eligibility				Replacement Rate		
	Low skilled	*Medium skilled*	*High Skilled*		*Low skilled*	*Medium skilled*	*High Skilled*
15-19	2%	-	-	*15-19*	47%	-	-
20-24	3%	6%	-	*20-24*	50%	41%	-
25-39	5%	20%	19%	*25-39*	44%	46%	33%
40-54	11%	24%	37%	*40-54*	44%	43%	38%
55-69	16%	25%	37%	*55-69*	44%	43%	38%

Source: EU-SILC, own calculations.

United Kingdom

Jobseeker's Allowance (JSA) is the main benefit for individuals out of work in the UK and is made up of two parts: a contributory benefit-based part on the basis of insurance contributions and an income-based part which is unrelated to contributions. Whereas income-based JSA is means-tested, contribution-based JSA is not. JSA (contribution-based) is a personal benefit paid to unemployed people who have 'sufficient' national insurance contributions. This means that contributions paid in one of the two tax years on which the claim is based amount to at least 25 times the minimum weekly contribution for that year, and contributions paid or credited in both years amount to a total of at least 50 times the minimum contribution. Contribution-based benefits are paid up to 182 days, whereas income-based JSA is paid as long as the conditions are fulfilled. Contribution-based JSA is a flat-rate benefit, which was GBP 64.30 per week for individuals aged 25 or over and GPB 50.95 for younger individuals in 2009. The amount of JSA (income-based) varies according

to family circumstances and income but a basic level is GBP 100.95 for couples (both over 18) and the basic level of benefit of a single is the same as for contribution-based JSA. The New Deal for 18 to 24 year old individuals is a mandatory programme for young individuals claiming JSA for at least 6 months. It includes: a Gateway; a choice of four options which include an element of training; and follow-through help for those who return to benefits after the programme. JSA benefits are taxable, social security contributions do not arise.

In the UK the eligibility rate as well as the replacement rate are comparably low. Eligibility seems to decrease somewhat along the age-groups, especially for low- and medium-skilled individuals which may be a consequence of the means-test. The replacement rate is rather constant across the working-life-cycle, implying an absolute increase of benefits with age. This may be a hint that the share of income-based JSA rises with the age. As unemployment benefits are wage-independent they are represented in the model in the variable 'b00' instead of 'xi1' and 'brepl'. The value of 'b00' is derived by multiplying the eligibility rate by the replacement rate for each age- and skill-group.

Table 26: Unemployment Benefit Eligibility and Replacement Rate in the United Kingdom

	Eligibility				Replacement Rate		
	Low skilled	*Medium skilled*	*High Skilled*		*Low skilled*	*Medium skilled*	*High Skilled*
15-19	24%	-	-	*15-19*	15%	-	-
20-24	57%	31%	-	*20-24*	21%	26%	-
25-39	31%	30%	20%	*25-39*	23%	20%	17%
40-54	34%	21%	23%	*40-54*	25%	22%	16%
55-69	22%	23%	22%	*55-69*	31%	21%	17%

Source: EU-SILC, own calculations.

2.12. Pension Benefits

Pension systems play a major role in the social security systems of the Member States. The systems in the various countries differ significantly, not only in their generosity, but also in the division between public and private pension provision and many other institutional details. In many European countries, the pension system is basically a public PAYG system, but several countries also have pension benefits financed by tax revenues or a funded pillar that is often managed privately. One should keep in mind, however, that even in case of a high importance of a private system still governments often play an important role, for instance by setting general regulations or by providing subsidies for private saving.

This short overview of pension systems in the calibrated countries is primarily based on OECD's 'Pensions at a Glance' (2011), which provides information on country-specific details for the year 2008, and the MISSOC database of the European Commission. It is far from giving a complete picture of pension schemes. Instead, we will provide a basic overview of the systems and present information which is important for setting parameters in the model.

Many countries have reformed their systems in recent years, often accompanied by transition periods between the 'old' and the 'new' system. As a general rule, we model the new system which is in place after the period of transition has ended. In our view, this approach results in an adequate illustration of labour market incentives for those individuals currently participating in the labour market. In order to reflect expenditures of the government and household income, we top up these pension benefits (which are mostly lower than actual benefits of current retirees) by flat pension benefits.

Given some rather general assumptions that we also apply in the model (such as perfect foresight and perfect capital markets), funded pension systems can be seen as perfect substitutes to private savings. Under these conditions, private households will react to higher contribution rates in the funded system by reducing private savings by the increased amount. In addition, as for example shown in Keuschnigg (2005), a funded system does not distort labour market incentives. One could therefore neglect to model funded pension systems. However, our approach is to include funded pension systems in the model as the government treats pensions quite differently compared to private savings in some of the countries.

Austria

Austria runs a compulsory pension scheme that provides earnings-related pension benefits, to a large extent financed by contributions of employees and employers, with an income-tested top-up for low income retirees. Statutory pension age is 65 for men and 60 for women, but the pension age for women will gradually be harmonised to match legal retirement age of men of 65 until 2033. 180 months of insurance within the last 30 years or 300 months of contribution during the full lifetime are necessary to qualify for a pension benefit. Alternatively, 180 months of contributions actually paid are sufficient.

Benefits are determined by the amount of income, the duration of insurance and the age of application. In the 'new' system, 1.78 percent of the calculation base (gross income) are credited to the pension account. Contributions are payable up to a ceiling of a yearly income of EUR 55,020 (2008). Past earnings are re-evaluated according to wage growth. Periods in which a person receives unemployment benefits or unemployment assistance are treated as number of pensionable years and entitlements are based on 70 percent of the last gross labour income before receiving unemployment insurance (64 percent for unemployment

assistance). In principle, it is envisaged that pension payments are adjusted by price inflation, but recent adjustments have been somewhat higher.

In general, early retirement is currently possible three years before the statutory retirement age, under the condition of 37.5 years of contributions and credits. For each year of retirement before the regular pension age, benefits are reduced by 4.2 percent. The same incremental factor applies to deferred retirement between 65 and 68, but there is no additional increment thereafter. Furthermore, there are (for certain groups) further types of early retirement.

Disability pensions play an important role in Austria and it seems like they have developed towards a popular alternative for early retirement. Invalidity pensions cover the risk of incapacity for habitual occupation, total incapacity, invalidity and original invalidity. The benefit is mainly dependent on previous labour income.

Belgium

Belgium has an earnings-related public pension scheme with a minimum pension and a means-tested safety net. The statutory retirement age is 65, both for men and women (since 2009). Drawing a full pension requires a full career of 45 years. The mandatory public system is complemented by voluntary private pension schemes.

Earnings-related pension benefits are based on lifetime income. The annual accrual rate is dependent on the family status of the individual. Since 2009, it is 0.6/45 for a single or a married person without dependent spouse, whereas it is 0.75/45 for a married person with dependent spouse. In 2008, the ceiling of yearly pensionable earnings was EUR 46,895. Earlier years' earnings are revalued in line with prices.

Under certain conditions, non-contributory periods, such as e.g. periods of pre-retirement pension, certain periods of career interruption or maternity leave are also credited. Periods of unemployment with eligibility for insurance benefits are also credited based on earnings prior to the period of unemployment. According to the OECD, pensions in payment are indexed to a consumer price index (which excludes some goods), although some discretionary adjustments have been made recently.

Since 2005, early retirement with the age of 60 is possible if 35 years of contributions have been reached. There is no actuarial reduction of pension benefits but benefits may be lower due to incompleteness of insurance years. According to the OECD, deferment of retirement after the normal retirement age is possible and can be used to close career gaps and to obtain higher pension benefits. Disability pensions cover workers who, as a result of sickness or infirmity, cannot earn more than one third of the normal earnings of a worker in the same category. The benefit is dependent on the family situation and foregone earnings.

Czech Republic

The public pension system in the Czech Republic has a basic element and an earnings-related part. It is complemented by a voluntary private pension. The statutory retirement age of men will gradually increase to 65, whereas it will be 62 to 65 years for women, depending on the number of children. In 2008, minimum requirement for the eligibility of pension benefits are 25 years of contribution, which will gradually increase to 35 years. Individuals can receive a pension from the age of 65 subject to certain conditions.

The basic pension benefit was CZK 1,700 (around EUR 64) per month in 2008, with an increase to CZK 2,170 in August 2008. The assessment base for the earnings-related benefit will gradually increase to the 30 years preceding retirement (from 2015 on). In principle, the accrual rate in the earnings-related part is 1.5 percent. However, not all earnings are included in the assessment base. Income is incorporated by 100 percent up to monthly earnings of CZK 10,000 (EUR 420). It is incorporated by 30 percent for income between this value and CZK 24,800 and by 10 percent above CZK 24,800. Earlier years' earnings are revalued by the growth of economy-wide average earnings.

Several non-contributory periods, such as child care, education or invalidity are taken into account for the calculation of benefits. Periods of earnings-related unemployment insurance benefits as well as unemployment spells without entitlements (for a certain period) are credited. According to the OECD, the unemployment period credited is reduced to 80 percent of the actual spell of unemployment. There is no specific statutory regulation for the indexation of pension benefits in payment for the two types of pension. However, the combined basic and earnings-related benefit is indexed to prices plus at least one third of real wage growth.

Under certain conditions, it is possible to retire three years before the statutory retirement age. The actuarial adjustment for early retirement is 5.3 percent per year for the first 720 days of early retirement. Deferment of pension claims is credited by an actuarial adjustment of pension benefits of 8.9 percent.[15] In the pension system disability is handled within three different degrees of invalidity. Disability benefits consist of two elements: a basic amount and an earnings-related part based on average earnings and the years of insurance.

Denmark

Denmark has a rather complex pension system that consists of a tax-financed public basic scheme, a statutory, fully funded scheme (ATP) and a 'quasi-compulsory' occupational scheme that covers around 90 percent of full-time workers. Both the ATP scheme and the

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[15] Figures refer to a full-career worker.

occupational scheme are taken into account in the model. The standard retirement age is currently 65 but will gradually increase to 67 until 2027.

In 2008, the full basic pension amounts to DKK 61,152 and the full pension supplement to DKK 61,560 per year for singles and DKK 28,752 for couples. Both schemes require 40 years of residence in Denmark between age 15 and 65, with a proportional reduction for shorter periods of residence. The supplement is tested against all sources of personal income apart from public pension. If personal income (including ATP and occupational pensions) is in excess of DKK 57,300 for singles (DKK 115,000 for couples), the pension supplement is reduced by 30 percent (15 percent) of the excess income. Public old-age pensions are adjusted annually in line with average earnings.

The occupational schemes are fully funded defined-contribution schemes which are agreed between the social partners. We follow the OECD by assuming that the average contribution rate for these schemes is 10.8 percent. ATP is a statutory, fully funded defined contribution scheme which covers all wage earners and almost all recipients of social security benefits, whereas self-employed individuals can voluntarily join. According to the OECD, coverage is almost universal. The contribution to the ATP scheme is a fixed amount that varies only with the number of hours worked (and not with income). A full-time employee contributed DKK 2,927 in 2008, which are paid by two-thirds by the employer and by one third by the employee. According to the OECD, the yearly adjustment of the contribution has been more or less in line with earnings in the last 20 years. In line with the OECD, we assume that the funded scheme earns the same interest rate as funded schemes in other OECD countries.

A partial early retirement pension for workers aged between 60 and 65 who continue to work for 12 to 30 hours a week is being phased out. A further early retirement scheme is linked with unemployment insurance and pays benefits between 60 and the normal retirement age. In order to qualify, individuals must have been members of the unemployment insurance system for at least 25 of the last 30 years and have to satisfy the conditions for entitlement to unemployment benefits. The benefit corresponds to unemployment benefits, with a limit of 91 percent of the maximum rate of unemployment benefits. People covered by an early-retirement programme revert to the standard old-age pension scheme when they reach the statutory retirement age of 65. It is also possible to defer old age pensions. The increment for deferring pension benefits is the ratio of the period of deferral to average life expectancy at the time the pension is drawn.

Invalidity pensions offer a tax financed universal protection for all inhabitants. They cover the risk of a permanent reduction of the capacity to work to an extent that the person cannot assure her/his subsistence. If income does not exceed a certain level, the benefit is DKK 183,000 per year for persons living alone and DKK 155,000 for married or cohabiting pensioners in 2008. The pension is automatically converted into an old-age pension at the age of 65.

Germany

The pension system in Germany is an earnings related PAYG-system with a social-assistance safety net for low-income pensioners. Pension eligibility requires five years of contributions at a retirement age of 65 and 35 years of contributions for early retirement. The statutory retirement age will gradually increase to 67 in the next decades. There is also an additional voluntary private pension system ('Riester-Rente').

The valuation of individual pension contributions depends on personal income relative to average earnings: if a worker earns average income, the contributor gets one point in the public pension system. In 2008, employees contribute up to a ceiling of EUR 63,600 of gross wage earnings (respectively EUR 54,000 in the new Länder). At retirement age, accumulated points are multiplied by the value of a point. In 2008, the yearly value of one point was EUR 316.98 in the old Länder and EUR 278.58 in the new Länder.

Periods of sickness, rehabilitation, unemployment and educational spells are accounted for in the calculation of pension benefits. During the first period of unemployment, entitlements are earned on the basis of 80 percent of previous gross earnings. If unemployment benefits II ('Arbeitslosengeld II') is paid, the unemployment insurance grants contributions on the basis of EUR 205 per month. In principle, pension payments rise in line with gross wages. However, if the contribution rate is adjusted, the increase in pension payments is adjusted, too. Additionally, the sustainability factor has to be taken into account, which links the dependency ratio and pension payments.[16]

Early retirement is possible from an age of 63 (for long-term insured persons with at least 35 years of contributions). In this case, deductions of 3.6 percent per year of earlier retirement are applied. In addition, there are several other possibilities to retire earlier (connected, for example, with severe disability or unemployment) without penalties. Each year of deferred pension benefit after the statutory retirement age leads to an increment of six percent.

Disability pensions are paid in case of reduced earnings capacity. This pension is paid until an age of 65. Afterwards the public system pays the normal old-age pension. For each month retiring earlier than 63, pension payments decrease by 0.3 percent, up to a maximum of 10.8 percent.

Finland

The public pension system in Finland provides an income-tested basic state pension (national pension) and a range of earnings-related schemes (with very similar rules for

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[16] These factors were integrated in the pension system with the aim to limit the increase of the contribution rate from currently 19.9 percent to 22 percent.

different groups). The pensionable age for the national pension is 65, pension age for the earnings-related pension is free to one's own choice between the age of 63 and 68.

The full amount of the basic pension lies between EUR 495 (2008) and EUR 560 per month, depending on the marital status. A full pension requires at least 80 percent of residency in Finland between the age of 16 and 65 and the benefit is reduced proportionally if this requirement is not fulfilled. The basic pension is withdrawn against income from the earnings-related scheme.[17] Following the OECD, we cover the earnings-related scheme for private sector employees. From 2005, the accrual rate amounts to 1.5 percent of pensionable earnings for an age between 18 and 52, 1.9 percent for an age between 53 and 62 and 4.5 percent for an age between 63 and 67.[18] Earlier years' earnings are valorised in line with a mix of price inflation (20 percent) and wage growth (80 percent).

Several non-contributory periods are credited. Earnings-related unemployment benefits accrue rights based on 75 percent of the income on which the unemployment benefit is based. After the period of unemployment benefits, a flat-rate unemployment assistance can be claimed, but unemployment assistance does not entitle to pension rights. Pensions in payment are indexed by a mix of price inflation (80 percent) and earnings growth (20 percent).

The national pension is available from 62, but the benefit is permanently reduced by 4.8 percent per year of early retirement. The earnings-related benefit is also available from the age of 62 and is reduced by 7.2 percent per year until the age of 63. For a higher retirement age there is no actuarial reduction, but a much higher accrual rate of pension benefits (see above). It is also possible to defer the pension. The basic pension is adjusted by 7.2 percent per year of later retirement. The earnings-related part is increased by 4.8 percent per year from the age of 68, but, again, there is no adjustment until 68 as the accrual rate is already higher. Invalidity pensions are also comprised of a basic pension and an earnings-related part.

France

The pension system for private sector employees has two tiers in France: an earnings-related public pension scheme and mandatory occupational schemes. In addition, the public system features two kinds of minimum pensions. Normal pension age for the earnings-related pension is 60, and a full public pension requires 41 years of contributions.

The public pension targets a replacement rate of 50 percent after a full career, each missing quarter of a year of contributions reduces the pension. The pension benefit is calculated on

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[17] Details for the withdrawal can be found in OECD (2011) and the MISSOC database.
[18] Pensionable earnings are calculated by deducting the employee's pension contributions from earnings.

the basis of the 25 years of highest earnings, where earlier years' earnings are valorised in line with price inflation. The ceiling for eligible earnings is EUR 33,276 (2008). Periods of unemployment are fully credited for the state pension if unemployment benefits are received, but these periods will not belong to the 25 years of highest earnings. There are also credits for the first period of unemployment without unemployment payments. Benefits in payment are indexed to price inflation.

There are different occupational schemes in place, but, in line with the OECD, we will only focus on the ARRCO scheme here, which covers the majority of private-sector employees. Below the ceiling of the scheme, claims accumulate for 6 percent of earnings, whereas they accumulate for 16 percent for earnings between the ceiling and three times the ceiling. The number of points earned per year is determined by the value of these contributions and the costs of one point (EUR 13.97 in 2008). At retirement, the accumulated number of points is converted into benefits by multiplying them with the value of a pension point (EUR 1.16 in 2008). Uprating of the costs and the value is agreed between the social partners. The current agreement implies an increase of the costs in line with earnings and of the value in line with prices. This uprating policy affects both indexation of pensions in payment and uprating of earlier years' earnings. Periods of unemployment entitle to pension benefits in the occupational system if the person had contributed to one of the plans before the beginning of unemployment.

According to the OECD, early retirement is possible under certain conditions by a separate programme administered by the employment fund. At the legal retirement age, individuals switch to the public pension. In the occupational pension schemes, early retirement is also possible, often subject to deductions depending on the age and/or the years of contributions. If individuals retire later, they continue to accumulate points in the scheme. According to MISSOC, disability benefits are provided to persons who, as a results of sickness or infirmity, can no longer (in any occupation) earn more than one third of the normal earnings of a worker in the same 'category, training and region'. The benefit is dependent on the salary during the ten years with the highest income and the amount of incapacity.

Italy

The new Italian pension system is based on notional accounts and applies in full to labour-market entrants from 1996 onwards. The legal retirement age is 65 for men and 60 for women. In this new system, a minimum requirement of 5 years of contributions is necessary to qualify for benefits. There is also a voluntary, supplementary occupational system. These funds provide an annuity based on contributions and the contribution rate was 6.91 percent in 2008, but the coverage of the funded system is still low.

The contribution-based regime is financed by a rate of 33 percent, of which around one-third is paid by the employee and two-thirds by the employer. The yearly salary ceiling was EUR

89,000 in 2008. The pension benefit is calculated as a product of lifelong contributions (which are valorised with the nominal GDP growth rate) and the transformation coefficient. The transformation coefficient is available for the age of 57 to 65, but workers are not allowed to retire if they have not reached eligibility. The coefficient is mainly determined by the probability of death, by leaving a widow or widower and the expected number of years that a benefit will be withdrawn. It is possible to defer pension benefits after age 65 but, as the transformation coefficient remains the same, benefits increase only because of higher accumulation of contributions and not because of actuarial adjustment.

Non-contributory periods of illness, maternity, military service, unemployment and the receipt of allowances for persons benefiting from special measures are credited in the public pension system. Unemployment spells give rise to credited contributions that are based on previous earnings. There are some exceptions, but in principle, the government pays the contributions in this case. The indexation of pension payments is rather complex. Benefits below a threshold have full price indexation, higher benefits are only partly indexed to price inflation.

Invalidity allowances cover workers whose earning abilities are permanently reduced to at least two thirds as a result of sickness or infirmity. Incapacity pensions are payable to persons who are absolutely and permanently incapable of any occupational activity. Benefits are determined by reference earnings and the number of insurance years.

Netherlands

The Dutch pension system has two main tiers, a basic flat-rate public scheme and earnings-related occupational plans. Even though there is no statutory obligation for employers to offer a scheme, coverage is almost universal (91 percent of employees). Statutory retirement age is 65 in the Netherlands.

For each year an individual lives or works in the Netherlands, the *basic benefit* accrues at two percent of the full amount. In 2008, the full yearly pension benefit was EUR 12,718 for a single and EUR 17,380 for a couple. This benefit is linked to the minimum wage, which is uprated biannually. The basic pension is not payable before the age of 65.

The *occupational pension* system consists of 656 pension funds (end of 2008). Fortunately, the OECD gives a good overview of average values in these funds. For about 97 percent of the participants in a defined-benefit scheme, the earnings measure for the calculation of pension benefits is lifetime average earnings. In most of these average salary schemes, the accrual rate is between 1.75 and two percent. Usually, there is no ceiling to pensionable earnings. There is no legal requirement for valorisation of earlier years' earnings and indexation of pensions in payment. For around 85 percent of participants in average wage schemes, past earnings are uprated with growth of average earnings, while inflation is used

for the other 15 percent. Around 60 percent of pensions in payment are indexed to wage growth and around 35 percent to price inflation. The occupational pension plans usually do not provide credits for periods of unemployment. The rules on pension deferral vary between the different occupational plans. For the modelling, we assume actuarial adjustment of claims in case of early or late retirement.

Invalidity pensions provide insurance for an individual who is considered completely or partially incapable of working if, as a result of sickness or infirmity, he/she cannot earn the same as healthy workers with similar training, skills and location. Benefits depend, among other features, on previous wages of the disabled person.

Poland

In 1999, a new pension system was introduced in Poland. It applies to people born in 1949 or later and is based on a system of notional accounts. People born in 1969 and later are obliged to participate in a funded scheme and people born between 1949 and 1968 can choose to opt in. The legal retirement age is 65 for men and 60 for women and individuals have to contribute for at least 25 (men) or 20 years (women) in order to qualify for pension benefits. There is also a minimum pension.

In the new earnings-related part, 12.22 percent of earnings (or 19.52 percent for older workers who do not opt into the funded system) are credited to individuals' notional accounts. The ceiling to contributions is set to 2.5 times the average earnings projected for the corresponding year. The notional interest rate of the earnings-related part is defined as 100 percent of the growth of the real covered wage bill (and no less than price inflation). The benefit is calculated by dividing the accumulated notional capital by the average life expectancy at retirement age ('g-value'). For those individuals participating in the funded system, 7.3 percent of earnings are diverted to the funded scheme. Pension savings of the funded system are converted into annuities by using unisex life tables at retirement age.

During periods of unemployment receipt, the government pays contributions to the pension system depending on the benefit. Further non-contributory periods that are credited contain sickness allowance, parental leave, university education and caring for dependent persons. From 2008 onwards, pension benefits are uprated in line with at least 80 percent of prices and 20 percent of average earnings in the past year.

There are no general provisions for early retirement in the pension system. From 2009, the bridging pensions system allows people working in special conditions to retire up to five years before the legal retirement age. Both pension components can be deferred without any age limits implying higher benefits.

Invalidity pensions cover the risk of long-term or permanent infirmity where people are unlikely to regain working capacity even after rehabilitation and the system includes total and partial (if the insured person is unable to perform her usual work but capable of a different job) incapacity. Invalidity benefits depend on the reference wage, the number of years of insurance, the extent of incapacity and a basic amount.

Slovak Republic

The pension system in Slovakia basically consists of an earnings-related public system similar to a points system. At the beginning of 2005, defined-contribution plans were introduced. Statutory pension age is gradually being equalised to 62 for men and women. Eligibility to pension benefits requires 15 years of pension insurance.

Contributors to the earnings-related pension scheme earn annual pension points which are calculated based on the ratio of individual earnings to economy-wide average earnings. There is also a ceiling to pension contributions (four times lagged average earnings[19]) and entitlements (at three times lagged average earnings). The sum of entitlements is multiplied by the pension-point value, which is indexed to average earnings. Following the OECD, this is equivalent to an accrual rate in a defined-benefit scheme of 1.25 percent. There are several non-contributory periods, such as caring for children or sickness absence, which are credited. However, spells of unemployment are not credited in the pension system. Pensions in payment are indexed to the average of wage growth and price inflation.

The government introduced a defined-contribution system in 2005. The contribution rate in this scheme is 9 percent. For workers who joined these plans, benefits under the public earnings-related scheme are an aliquot part of public benefits of those workers who totally remain in the public earnings-related plan. These workers are supposed to get one half of their pension benefits from the earnings-related part, the other part from the defined-contribution part.

Under some conditions, early retirement is possible and benefits are reduced by 6.5 percent per year of early retirement. It is also possible to retire with an age higher than the statutory retirement age, in which case the benefit increases by 6.5 percent per year. An individual is entitled to invalidity pension if his/her capacity for work is reduced by at least 40 percent compared to that of a healthy person. Among other details, disability benefits depend on the level of incapacity and lifetime employment income.

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[19] For instance, the ceiling for the first half of 2009 was four times average earnings in 2007, the ceiling in the second half of 2009 was four times average earnings in 2008.

Spain

The public pension system in Spain consists of an earnings-related benefit with a means-tested minimum pension. Statutory retirement age is 65 years both for men and women. In order to qualify for a pension benefit, 15 years of contributions are necessary.

The earnings base for the calculation of the pension benefit is average earnings over the last 15 years and these years' earnings are valorised with prices (apart from the last two years). The ceiling was EUR 36,889 in 2008. Benefits accrue according to a schedule so that the 'replacement rate' is 50 percent with 15 years of contributions. For additional ten years, benefits accrue with three percent per year and further years with an accrual rate of two percent per year so that maximum accrual of 100 percent is reached with 35 years of contributions.[20]

Several non-contributory periods such as parental leave or leave to take care of relatives are credited. During periods of receipt of unemployment benefits, the government takes over all the employer's contributions and 35 percent of employee's contributions to the pension insurance scheme. Contributions are based on previous earnings.[21] Periods of unemployment assistance are not credited. Pension benefits in payment are indexed according to price inflation.

The possibility of early retirement is dependent on the year of entering the system. For example, for those entering the system in 1967 or later, early retirement is available from the age of 61 for an unemployed person, according to the OECD. The actuarial reduction of the pension benefit is determined by the number of years of contributions and ranges from six percent to 7.5 percent. Deferred retirement is also possible but the increase of the benefit is much less pronounced. Disability pensions are, among others, dependent on the degree of incapacity, previous earnings and the age of the individual.

Sweden

The public pension system in Sweden consists of an earnings-related part based on notional accounts and a smaller mandatory contribution to a defined-contribution funded pension system. There is also an income-tested top-up, the 'guarantee pension'. Furthermore, there is a system of occupational pension plans and coverage in these plans is almost universal at a rate of around 90 percent of employees. In principle, the Swedish system features a flexible retirement age starting from the age of 61.

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[20] As earnings are valorised with prices only, the replacement rate relative to the final salary is lower than 100 percent.
[21] The remaining 65 percent are paid by the unemployed individual.

Contributions of 18.5 percent of pensionable pay, which corresponds to an effective contribution rate of 17.21 percent of gross earnings, are credited. Whereas 14.88 percent of earnings are devoted to the notional-accounts system, 2.33 percent are paid to the funded pension scheme. Contributions are levied up to a ceiling of gross earnings of SEK 387,000 in 2008.[22] In the *earnings-related part*, earlier years' earnings are uprated with a three-year moving average of average earnings. The earnings-related pension benefits are calculated by dividing the total amount of accrued pension rights of the earnings-related part by an annuity factor. The *defined contribution part* is financed by an effective contribution rate of 2.33 percent of earnings. At retirement, individuals can choose between an annuity to avoid investment risk and a variable annuity where their funds continue to be invested by their fund managers. In the labour market model, we assume that funds are paid as annuities indexed to price inflation.

There are four major *occupational schemes* in Sweden that are estimated to cover almost 90 percent of employees. We follow the OECD by modelling the new ITP1 plan, which is a defined-contribution plan. The contribution rate is 4.5 percent of salary for an income up to 7.5 income base amounts (SEK 360,000 for 2008) and 30 percent of additional income above that value.

Several non-contributory periods are also credited for pension entitlements. Unemployment benefits (and training allowances to unemployed individuals) are also pensionable income, in which case the government takes over the employer's contribution. Earnings-related pension benefits in payment are indexed with average earnings growth less an imputed interest rate of 1.6 percent.

There is no fixed retirement age in the public pension scheme. Retirement is possible from 61 and there is no upper age limit. The pension system provides an automatic actuarial reduction of benefits depending on the retirement age. The income-tested guarantee pension, however, cannot be claimed before the age of 65. Disability pensions are dependent on the three highest gross annual incomes during a certain period before the time of disability and on the degree of incapacity. For persons with low income, there is also a guaranteed compensation.

United Kingdom

The public pension system in the United Kingdom has two tiers, firstly, a flat-rate basic pension and secondly, an earnings-related additional pension which reformed the former earnings-related system from April 2002 on. Employees can contract out of the state second tier into private pensions. The legal retirement age for women is currently 60 years but it will

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[22] Employer contributions are also only paid up to the ceiling, but there is an additional tax on earnings above the ceiling which has exactly the same tax rate.

gradually be harmonised to match the current legal retirement age of men of 65 years. In the next decades, the legal retirement age of women and men will further increase to 68. According to MISSOC, people qualify for the basic pension by paying contributions to the social security system for at least 10 to 11 years. In 2003 the Pension Credit was introduced which is a tax free income related benefit and is paid if the income of the applicant is below a certain level.

The flat-rate amount of the basic state pension was 90.7 GBP (EUR 115) per week in 2008/09. It is paid 'pro-rata' if the number of qualifying years is less than the requisite number. The calculation of the state second pension is rather complex. The accrual rate is dependent on the amount of earnings.[23] Earlier years' contributions are uprated in line with average economy-wide earnings. According to OECD (2011), around 35 percent of employees are contracted out of the state second pension.

Periods in which a person receives unemployment insurance benefits or unemployment assistance benefits are credited for the basic state pension, but there are no credits on these benefits for the State Second Pension. After retirement, benefits are price-indexed. State pension benefits are not paid out before the legal retirement age. Since April 2005, there is no limit for State Pension deferral and the increment was increased to about 10.4 percent for each full year of deferral. It is also possible to decide for a taxable lump-sum instead of the increment.

Invalidity benefits are flat-rate benefits for people with physical or mental illness. In 2008/09, the flat-rate incapacity benefit amounted to 85 GBP weekly and there are further supplements according to age and family status.

2.13. Other social benefits

In addition to public unemployment and pension insurance other social benefits are available for private households in the modelled countries. The main database used for the division of benefits in different age- and skill-groups is EU-SILC. Given the availability of data the following cash transfers are reflected:

- Education allowance
- Sickness benefits
- Family allowance
- Social exclusion benefits
- Housing allowances

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[23] According to the MISSOC database, the accrual rate is 2 percent for earnings between the Lower Earnings Limit (LEL) and the Low Earnings Threshold (LET), 0.5 percent for earnings between the LET and a figure which is (3 x LET) - (2 x LEL) and 1 percent for earnings between the latter number and the Upper Earnings Limit from April 2010 onwards.

Some of them are defined on an individual level (education allowances, sickness benefits), whereas the others are defined on a household level. Benefits which are only available on a household level are divided upon the household members for the calibration of the model in the following way. Each person in the household aged 25 or older and each person of a lower age whose mother and father are not members of the household, receive the same share of the total household benefit. This means that these benefits are divided equally upon this group of persons in the household. The level of aggregate expenditures is largely based on information of the OECD *Social Expenditure Statistics.*

Data of the EU-SILC about education allowances needs to be modified for the model as education is ongoing for younger age-groups. Without adjustment the share of allowances granted would be too high for low- and medium-skilled persons whereas high-skilled persons would only receive grants with a finished tertiary education. For this reason we divide education allowances for 15 to 19 years old persons according to the population share in the model between medium- and high-skilled persons. For 20 to 39 years old persons we assign all benefits to high-skilled persons. For older age-groups we use the data directly without any corrections.

Sickness benefits are assigned only to employed persons or persons receiving unemployment benefits. In addition we assume that the amount paid to employed and unemployed persons is the same. Sickness benefits are reflected in the model in the variables 'zw' and 'zu' as well as 'b00', which reflect fixed transfers if a person is employed or unemployed. 'zu' includes sickness benefits for unemployed persons receiving income-dependent unemployment benefits, 'b00' includes sickness benefits of unemployed persons receiving wage-independent benefits.

Benefits for social exclusion are divided between three groups of persons, namely persons in retirement, persons not participating on the labour market and persons in unemployment. This division is based on EU-SILC data by using information about how many months a person spent in these states. Only persons spending the whole year in one of these states are considered for the model. This way we exclude persons belonging less time to one of these states or those beingemployed for at least some months. This may distort the result to some extent but will, in our opinion lead to a more trustworth result than dividing income arbitrarily by counting all persons receiving social assistance. Social exclusion benefits for retired persons enter the model as lump-sum payments to private households. Benefits for inactive persons are included in 'ynonpar0' and benefits for social exclusion for unemployed persons are included in 'b00'. These transfers provide incentives not to take up or search for a job.

Information about the age- and skill structure of social expenditures is based on the EU-SILC. Total expenditures for the different social expenditure categories are provided by the OECD Social Expenditure Dataset and are used to scale benefits derived from the EU-SILC.

Although EU-SILC also provides information about total expenditures by aggregating individual or household data, small sample sizes may lead to an imprecise approximation of total expenditures. However, education allowances are directly taken from EU-SILC as the OECD Social Expenditure Dataset does not provide any information about this type of allowance. Total expenditures for educational allowances in percent of GVA for the modelled countries are shown in Table 27. There are significant differences in total expenditures. In the Northern countries, the values in percent of GVA are significantly higher than in the other countries.

Table 27: Total Expenditures for Education Allowances in Percent of Gross Value Added

	Education allowances
Austria	0.10%
Belgium	0.04%
Czech Republic	0.02%
Germany	0.18%
Denmark	0.90%
Spain	0.09%
Finland	0.39%
France	0.07%
Italy	0.08%
Netherlands	0.41%
Poland	0.07%
Sweden	0.91%
Slovakia	0.02%
United Kingdom	0.17%

Source: EU-SILC, Eurostat, own calculations

For the other categories of social expenditures, aggregate public expenses are based mainly on the values presented in Section 2.10. An overview about total public expenditures in percent of GVA is presented in Table 28. We deviate from the OECD aggregates for some countries. In Austria, expenditures for income maintenance in the model are lower than the amount the OECD reports. We use total expenditures derived from individual EU-SILC data implying a deviation from the OECD aggregate amounting to 0.1 percent of GVA. Using OECD total expenditures would lead to overpriced benefits from income maintenance. In the Czech Republic, based on data of EU-SILC, we move expenditures amounting to 0.15 percent of gross value added from family benefits towards income maintenance. It seems to be the case that expenditures are classified differently in which case we follow the information based on EU-SILC. In Denmark public expenditures for income maintenance according to the OECD amount to 0.82 percent of GVA, whereas EU-SILC data do not contain any income of the households from this source. As discussed below in the country

section, eligibility for income maintenance in Denmark requires persons to be eligible for the labour market. For this reason, this type of household income may be captured in the unemployment income instead of social exclusion income.[24] Therefore, we set total public expenditures for income maintenance equal to zero.

In Italy, total public expenditures for social exclusion and public housing assistance according to EU-SILC are considerably higher than the OECD database would suggest. For this reason, we follow the information in the EU-SILC data. For the Netherlands the OECD Social expenditure dataset contains remarkable changes concerning expenditures for paid sick leave and income maintenance. About 2 billion Euros were shifted away from paid sick leave towards income maintenance. We shifted these 2 billion Euros back to paid sick leave for the years 2006 and 2007 as otherwise social exclusion benefits for unemployed person would be much too high.[25] In UK total public expenditures for these categories based on EU-SILC and OECD differ to a large extent. It seems to be the case that these are classified differently in the two data sources. For this reason, we follow the information provided by EU-SILC.

Table 28: Total Public Expenditures in the Model for Different Social Events in Percent of Gross Value Added

	Paid sick leave	Family allowances	Housing assistance	Income maintenance
Austria	0.19%	2.59%	0.12%	0.10%
Belgium	0.58%	1.85%	0.11%	0.39%
Czech Republic	1.07%	1.28%	0.08%	0.24%
Germany	0.28%	1.34%	0.09%	0.15%
Denmark	1.25%	1.82%	0.82%	0.00%
Spain	1.21%	0.51%	0.19%	0.10%
Finland	0.64%	1.81%	0.31%	0.35%
France	0.59%	1.53%	0.89%	0.39%
Italy	0.22%	0.68%	0.06%	0.10%
Netherlands	1.23%	0.74%	0.41%	0.76%
Poland	0.71%	0.96%	0.14%	0.15%
Sweden	1.43%	1.73%	0.59%	0.38%
Slovakia	0.29%	1.70%	0.00%	0.53%
United Kingdom	0.61%	1.65%	1.12%	0.75%

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[24] This seems to be confirmed by the fact that eligibility for unemployment benefits differs significantly between information based on the LFS and the EU-SILC. Eligibility according to the EU-SILC is much higher than according to the LFS.

[25] Social exclusion or income maintenance benefits are distributed between persons not participating on the labour market, already retired persons and unemployed persons not eligible for unemployment benefits (neither insurance nor assistance).

In the following we describe the different systems for family allowances, housing allowances and social exclusions in the modelled countries.

Austria

In Austria, two types of social assistance exist, the social welfare (Sozialhilfe) and the supplementary pension (Ausgleichszulage). The latter one is paid to retirees or persons incapable of working. Social assistance is granted at the federal level and differs between the federal provinces 'Bundesländer'.[26] On average the monthly benefit for a single person in 2009[27] amounts to EUR 510, for a couple EUR 771 and EUR 149 for a dependent child below an age of ten and EUR 166 for an older child. General assistance entitlement depends on household resources, i.e. it is means- and income-tested. The benefit is not taxable and not subject to social security contributions.

The system of housing benefits is rather complex in Austria. The amount of benefit depends on the region. For this reason we use microdata from the EU-SILC to derive an average benefit. Benefits are granted on the federal level and can be covered by social assistance or other schemes. In Vienna, for example, there exists a rent allowance 'Mietbeihilfe' for people receiving social assistance benefits. The maximum rent allowance for 1 or 2 persons in a household amounts to EUR 256 per month up to EUR 302 for seven or more persons in a household. Additionally, a household receiving rent allowance can also claim an allowance for heating costs amounting to EUR 41 per month.

Family benefits are paid for families with dependent children and are differentiated with respect to age and the number of children. The benefit amounts to EUR 105 per month for a child below the age of three, EUR 113 for a child up to the age of ten, EUR 131 up to the age of 19 and EUR 153 up to the age of 26. If there is more than one child, than a supplement is paid, amounting to EUR 13 for the second child, EUR 35 for the third child and EUR 50 for the fourth and further children. In addition, a thirteenth allowance is granted. Family benefits are not taxable and are not means-tested. Besides family benefits also childcare is granted. From 2009 on, expenditures for childcare are tax-deductible up to an amount of EUR 2,300 per year.[28] For parents leaving the labour market for child-raising reasons a childcare allowance is granted ('Kinderbetreuungsgeld'). Three options are available differing by the length of payment. The longest option pays benefits up to 30 months, the middle option 20

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[26] Starting from late 2010 a new system, called 'Bedarfsorientierte Mindestsicherung', was introduced. The transfer amounts to EUR 753 per month for a single person and EUR 1,129 for a couple in 2011. The benefit for children amounts to at least EUR 136 per month but varies between different 'Länder'. The amount also contains a 25 percent share for the housing rent. Persons receiving the benefit have to be available for taking up a job.

[27] See OECD Benefits and Wages.

[28] This is not reflected in the model as the transfer is not included in the EU-SILC (data in the EU-SILC are available only up to the year 2008 and transfers up to the year 2007).

months and the third option 15 months.[29] The benefits for these versions are EUR 436, EUR 624 or EUR 800 per month. There exists a ceiling for additional yearly earnings amounting to EUR 16,200. The child-care allowance is not taxable. Lone parents and married couples on low income can apply for a supplementary allowance amounting to EUR 6 per day.

Belgium

Social assistance in Belgium, called integration allowance, is an individual right and paid to persons who prove willingness to work. Eligibility requires an age of 18 (different rules for special cases). The classification is determined at the national level with no regional differentiation. The amount of the integration income depends on the family situation. A person living alone receives EUR 712, a single parent or couple EUR 949 and a cohabitant EUR 474. Family benefits are granted in addition to the minimum. Specific amounts are paid for persons working in a back-to-work programme. Benefits are not taxable and not subject to social security contributions. For persons aged 65 or above, there exists the 'Guarantee of Income', which is means-tested. It amounts to EUR 10,631 for a single person per year and EUR 14,174 for a two-person household.

Direct housing benefits are not available, but there exist schemes to assist the access to property as well as measures providing social housing dependent on income. The child benefit is granted to the active population (also including persons receiving integration income) with an age limit of the child of 18 years (25 years in case of vocational training or further education). The monthly amount for the first child is EUR 83, for the second EUR 154 and for the third and subsequent children EUR 230. For single parents whose professional or replacement income is below EUR 2,061, a supplement of EUR 42 for the first child is paid, decreasing to EUR 21 for the third and subsequent children. In addition, an age supplement once a year is paid, depending on the age of the child (between EUR 26 and EUR 76). Unemployed persons also receive a supplement from the seventh month of unemployment on. Parental leave benefits are paid to persons leaving the labour market for child-raising reasons (maximum three months in case of interrupting a full-time job, six months in case of a part-time job). To be eligible a person has to be on leave from the time of childbirth on and before it reaches the age of six. The benefit amounts to EUR 685 (EUR 342 in case of half-time interruption) in case of a previous full-time job and a total interruption. For persons in previous part-time employment the amount is reduced proportionally. In addition, birth and adoption grants can be claimed. For the first birth EUR 1,130 are paid and EUR 850 for all subsequent births. Family allowance and birth grant are not subject to taxation, but parental leave benefits are taxable (but no social security contributions).

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[29] If the other parent also engages in child-care activities, the length is increased by additional 6, 4 or 3 months for the three options.

Czech Republic

The social assistance or living allowance provides support for citizens who are in need for assistance due to health reasons, age or low resources. It includes social services and cash benefits. Benefits are means-tested depending on financial resources of the household. In case of unemployment, the person has to be registered with the public employment service. A supplement for housing is granted for persons or families not being capable to cover housing costs. To be eligible for the housing supplement the family must either be entitled to the living- or to the housing allowance. The amount of the housing supplement is determined by how much the difference of income and living minimum covers reasonable housing costs, which include rent, services related to housing and energy costs. The living minimum amounts to CZK 3,126 for a single person, CZK 2,880 for the second adult and CZK 2,600 for the third and any other adults in the household. The minimum for a dependent child lies between CZK 1,600 (under 6 years) and CZK 2,250 (15 to 26 years old). The subsistence minimum is available for persons who are out of work for more than 6 months and amounts to CZK 2,020. Social assistance benefits are not taxable.

The housing allowance is an income-tested benefit and supports low-income households to cover housing expenditures. Eligibility requires that 30 percent of the household income is not sufficient to cover housing costs and that 30 percent of the household income is lower than the *prescriptive* housing costs. The allowance does not cover total housing costs. It is derived as the difference between the prescriptive housing costs and 30 percent of the relevant household income. If actual housing costs are lower than the prescriptive housing costs rather than the actual costs are used for the calculation.

Family benefits consist of the child allowance, the social allowance and the parental allowance. The child allowance is provided to children up to the age of 15 and longer if a child invests in full-time education up to an age of 26. Entitlement requires that family income is below 2.4 times the living minimum. The child allowance amounts to CZK 500 per month for a child below the age of six, CZK 610 between six and 15 years and CZK 700 for an older child. The parental allowance is granted to a parent who provides full-time and regular care for the youngest child. Like in Austria different options for the benefit are possible. In the short option the benefit is paid for the first 24 months of the child's age and amounts to CZK 11,400. Benefits are paid for 36 months (CZK 7,600) in the second option, and in the third option 48 months (CZK 7,600 for the first 21 months and CZK 3,800 afterwards) are paid. The social allowance is indirectly related to lone parents. The aim is to assist low-income families to cover child costs. The benefit is income tested and eligibility requires that the parent takes care of a dependent child and that the family income is less than two times the living minimum. The allowance gradually diminishes as income rises. A higher level is paid to families in case of multiple births. The social allowance decreases with family income and rises with the age of the dependent child(ren). All three benefits are not taxable.

Germany

Social assistance (Arbeitslosengeld II) in Germany is discussed in chapter 2.11. Housing benefits are disposable for persons with low income and high rent. Persons receiving 'Arbeitslosengeld II' or a needs-based pension supplement in case of old age are not eligible for housing benefits. The housing allowance is determined by the size of the household, eligible income and housing costs by using a rather complicated formula. Eligible income is linked to taxable income expanded by several non-taxable income components to reflect disposable income of the household.

Family benefits consist of the family tax credit ('Kindergeld'), the parental allowance ('Elterngeld') and the supplementary child allowance. The family tax credit is granted to children up to the age of 18 (21 in case of unemployment) or 25 in case of education. The tax credit is independent of the income and rewarded as negative tax if the tax liability of the person who cares for the children is lower than the credit. The credit amounts to EUR 164 per month for the first and the second child, EUR 170 for the third and EUR 195 for the fourth and subsequent children. The parental allowance is granted to persons who take care for their children and work at most part-time. It amounts to 67 percent of labour income before the birth of the child with a minimum of EUR 300 and a maximum of EUR 1,800. The allowance is granted at most for the first 14 months after birth of the child. If only one parent applies for the grant then it is paid for 12 months. The supplement child allowance is available for persons being able to finance their own living costs, but who do not have sufficient resources available for their children. The allowance depends on the income of the family, the rent and additional needs and will be at most EUR 140 per month and child. In addition, costs for children up to the age of 14 can be deducted from taxable income if they exceed EUR 1,548 with a maximum deduction of EUR 1,500.

Denmark

Social assistance, like in most other countries, is the lowest security net. The duration of social assistance is unlimited. To be eligible an unfortunate event (like unemployment) must have taken place. If a person is entitled due to unemployment, job search is required. The benefit is family based meaning that it is obligatory for spouses to be available for the labour market. In general the benefit is granted only in cases in which the event could not be foreseen. The municipal authority may also cover foreseen expenses if they are of vital importance to the status of the person concerned or his/her family. The payment depends on age and is higher for persons above the age of 25. People between 18 and 24 receive less. The benefit amounts to DKK 9,505 (approximately 60 percent of the maximum unemployment insurance benefit) for a single person without dependent children and DKK 12,629 (approximately 80 percent) for a single person with dependent children. A married couple with children receives two times DKK 12,629 where income of the spouse is

subtracted.[30] After 6 months, the sum of social assistance and housing benefits for a couple may not be higher than DKK 12,629 (DKK 9,505) per month and person for singles and couples with (without) children. For a single person with dependent children the maximum benefit (social assistance plus housing benefit) after 6 months corresponds to DKK 15,755.[31] The municipal authority can also grant a survivor allowance with a maximum amount of DKK 10,000 if the annual income of the recipient is less than DKK 160,000. For higher income the allowance is reduced. The grant is also means-tested and social assistance benefits are taxable. For the first six months social security contributions are not applied. After this period the person pays the contribution to the supplementary pension scheme. In addition to social assistance, a household may receive a special housing benefit if the net rent (rent minus general housing benefits) is in excess of DKK 2,450. For families with children the net rent exceeding DKK 3,600 per adult (reduced by DKK 650 for the second and further children) is paid. The sum of social assistance (after tax) and special housing benefits has to be lower than previous labour income (for the first three months, afterwards the sum has to be lower than the maximum unemployment benefit after tax).

In Denmark, there exist two types of housing benefits, 'boligsikring' and 'boligydelse'. The first one 'boligsikring' is available for households with children or households with high rent and low-income (usually singles). Also persons with disability pension are covered. The second benefit boligydelse is granted to persons receiving old-age pensions or disability benefits. The housing benefit depends on household income, rent and the number of children and other individual characteristics. The rent is adjusted according to some indicative size of the accommodation. The considered size is a basis of 45 square meter plus 20 square meter for each additional person in the household. In 'boligsikring' the maximum yearly rent subsidized is DKK 69,900 and increased by 5 percent for each child. The subsidy is calculated as 60 percent of the rent diminished by 18 percent of yearly household income above DKK 124,600 (DKK 142,600 for a household with one child and additional DKK 32,800 for each further child). For a household without children or retirees the subsidy cannot exceed 15 percent of the rent. In 'boligydelse' 75 percent of the rent is paid, deducted by 22.5 percent of yearly income above DKK 132,000 (increased by DKK 32,800 for the second and further children). The maximum benefit in 'boligsikring' amounts to DKK 36,876 and DKK 39,060 in 'boligydelse'. Housing benefits are not taxable.

Family benefits in Denmark are available for all children below the age of 18. In contrast to many other countries the benefit decreases with the age of the child. Children between 0 and 2 receive an annual payment of DKK 16,428, between 3 and 6 of DKK 13,004 and DKK 10,232 for older children. This benefit is not means-tested and not taxable. Lone parents receive an additional payment of DKK 4,780 per year and DKK 4,696 for each child.

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[30] An amount of DKK 13.79 per hour worked is deducted from income (7.4 work hours per day required, not more than 160 per month). After 6 months of payment, DKK 33.61 per hour are deducted.
[31] A person younger than 25 can receive DKK 6,124 (DKK 5,177 after 6 months), if she/he does not live with the parents. If she/he lives with one or both parents the benefit decreases to DKK 2,956 (DKK 2,574 after 6 months).

There also exists a study supplement of DKK 6,160 for each parent who is studying (income-tested). For low-income households day care of the children is subsidized (day care is for free for households with an income below DKK 143,000). The rate decreases linearly from 23.75 percent to zero for household income above DKK 443,800. The benefit is also not taxable.

Spain

The social assistance scheme 'Ingreso Minimo/Renta Minima de Insercion' (MII) is implemented on the regional level, following the principle to alleviate poverty by cash benefits. On average, the basic amount of MII is EUR 404 per month, the amount for the second and further persons are considerably lower (e.g. in Madrid the supplement for the second earner is set to EUR 111 and EUR 74 for the third person). The transfer is updated annually and the claimant must actively search for a job. Eligibility requires a minimum age of 25 (less in case of dependants) and a maximum age of 64. Older persons receive an old-age pension. If a person participates in social and labour measures an income supplement is paid. Qualifying households will have to pass an income-test. The benefit is taxable.

Housing benefits are granted at a regional level, if there is a grant at all. A tax credit for housing expenses exists at the national level. Family benefits are available for dependent children (under an age of 18, or older if disabled) and for (multiple) birth or adoption (one-off lump-sum payments). The economic allowance is granted if yearly income is below EUR 11,264[32] if the child is not handicapped otherwise no income-test is applied. The economic allowance amounts to EUR 42 (EUR 500 per year) for children under three years and EUR 24 (EUR 291 per year) for older children. Benefits for disabled children depend on the degree of handicap (EUR 83 for a degree of 33 percent or more for children below 18, EUR 336 for a child above 18 and a degree of handicap of 65 percent or more, and EUR 505 for a degree of 75 percent and more). The grant for a birth or adoption amounts to EUR 2,500. In addition, large families, lone parent families or disabled mothers receive an additional amount of EUR 1,000. The grant for multiple births amounts to EUR 2,496 for two children, EUR 4,992 for three children and EUR 7,488 for four children. Family benefits are not taxable.

Finland

Social assistance is a residual final safety-net. Since 2008 there is a nationwide basic standard amount, in the years before two municipality categories existed. The benefit is means-tested and eligibility is tested year per year. For the income-test 20 percent up to a maximum of EUR 150 per month are deducted from family income. Social assistance consists of a basic amount and an additional amount to cover 'outgoings'. If the amount is

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[32] For higher income the benefit is reduced one by one.

higher than households net income the difference is paid as benefit. Housing costs are covered by an additional allowance. In most cases households have other income sources and social assistance tops up income. In 2007 more than 40 percent of these households received labour market support and 67 percent received housing allowance. The basic monthly amount in the social assistance is EUR 417 for a single or lone parent. Each person of a couple receives 85 percent of this amount (EUR 355). For a child older than 18, 73 percent of this amount is granted[33], 70 percent for a child older than ten and 63 percent for a younger child. For each additional child in the family the basic amount is decreased by 5 percentage points. An additional allowance is granted to cover reasonable housing costs, home insurance, expenditures for electricity, child day-care fees and larger health-care costs. The amount of social assistance may be reduced by 20 percent if a person rejects a work offer and 40 percent if refusal is recurrent. The benefit is not taxable.

Housing benefits are divided into three income-tested schemes, a general housing allowance, a housing allowance for pensioners and a housing allowance for students. The general housing allowance corresponds to 80 percent of the difference between the rent and the deductible amount, which is determined by the family type, the geographical location and increases with income. The rent is determined by the maximum area of the dwelling depending on the household size and the area of living, but also age and size of the flat. The benefits are not taxable.

Child benefits are paid for children below the age of 17 who live in Finland. The amount depends on the number of children in the household, supplements are available for lone parents. The pay per child increases from EUR 100 for one child to EUR 182 for five and more children. The benefit is not taxable. Lone parents receive an additional benefit of EUR 47 per child and month. Families with children under three years who do not use public day care can claim a home care allowance. It amounts to EUR 314 per month for the first child, EUR 94 for any other child below an age of three and EUR 60 per month for children between three and six years old. In addition, there exists a home care supplement amounting to EUR 168 for only one child which is means-tested. There is also a private day care allowance consisting of a care allowance (EUR 160 per child and month, 50 percent for children in pre-primary education) and an income-tested supplement (EUR 135 per child and month, 50 percent for children in pre-primary education). The child home-care allowance is regarded as taxable income.

France

Social assistance in France is an individual right, taking into account the family situation, implying that a differential amount is paid. Persons are eligible if they are at least 25 years

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[33] A child aged 18 or more is considered as a separate household for the calculation of social assistance, implying a separate means test.

old (younger if a child is supported or the person is pregnant). There is also a connection to the labour market, as the person must be willing to perform training, integration or employment activities. The Guaranteed Minimum Resources (RMI) is determined at the national level. The income-test includes earnings from activities, interest from property and so on. Also family allowances and housing allowances are taken into account. RMI amounts to EUR 455 for a single person (basic amount) and EUR 682 for a household. For the next two additional persons 30 percent of the basic amount is granted for each person. For the fifth and further persons 40 percent of the basic amount is taken into consideration. For persons participating in training measures or work part-time (at least 78 hours per month) a 'back to work grant' of EUR 1,000 for at least four months is paid. After the fourth month up to one year the grant reduces to EUR 150 per month for a single person and EUR 225 for a household. Housing allowances are included in the family resources to some extent, 12 percent for a single up to 16.5 percent for a three person household. RMI is not subject to taxation. A special scheme, the Solidarity Allowance, exists for persons aged at least 65 (60 in case of incapacity). It is also a differential allowance and amounts to EUR 7,781 per year for a single person and EUR 13,629 for a couple. Persons who are at least 80 percent disabled receive an allowance for disabled persons (EUR 653 per month) on a differential basis. In addition, Complementary Resources (EUR 179) and a Supplement for an Autonomous Life (EUR 105) can be granted. The Single Parent allowance is provided to single parents or pregnant women and amounts to EUR 584 for pregnant women without dependent child and EUR 195 per dependent child.

The housing allowance is available for families who receive one of the various forms of family allowances (see below). For the calculation of the allowance the rent (upper limit) and the family situation as well as the resources of the family are taken into account. It can be higher for beneficiaries with low income.

In France, several family benefits exist. The Child benefit is granted for children up to the age of 20 as long the income of the child is less than 55 percent of the minimum wage and it is paid only if there are two or more children. The benefit amounts to EUR 124 for two children per month and rises up to EUR 759 for six children. Each further child is granted with EUR 159. There is no income-test for this benefit. In addition a flat rate allowance of EUR 78 during one year maximum to families with three or more children can be granted. The Infant Welcome Benefit consists of two parts. One part of the benefit is granted for a birth or adoption and a second for the child education choice or child care choice. The Birth or Adoption Grant amounts to EUR 890 from the seventh month of pregnancy or EUR 1,779 for the adoption. The benefit is means-tested. In addition the Basic Allowance of EUR 178 is paid for the first three years after birth or adoption. The second type of benefit is granted for child-raising or child-care. The child-raising allowance is not means-tested but previous labour market activity is necessary. Beneficiaries must have at least one child under the age of three. The amount of the benefit is EUR 552 (partial amounts for part-time activity). For the third child a shorter period (12 months) could be chosen and the benefit amounts to

EUR 790 per month in case of complete suspension of activity. The child care allowance is a partial payment of care costs for children younger than six years (20 in case of serious disability) and requires a professional activity generating a minimum income. The benefit is decreased to 50 percent for a child between the age of three to six. Social contributions of a hired maternal assistant are paid entirely and to 50 percent if a person, who takes care of the child at home, is hired. For the presence of the parent 310 days are credited within three years by an amount of EUR 41 per day (EUR 49 for a single parent). For single parents a Single Parent allowance is granted (income-tested on a differential basis) to guarantee minimum income. The monthly amount is EUR 584 plus EUR 195 per child. The New School Year allowance is paid for children aged between six and 18. It is a one-off payment and not means-tested. The amount depends on the age of the child (EUR 273 for a child between six and ten years up to EUR 298 for a child between 15 and 18 years). Family benefits are not subject to taxation but are subject to the 0.5 percent contribution for the repayment of the social debt (single parents receiving single parent allowance are exempted).

Italy

In Italy, no universal support scheme exists with the exception of 'Assegno sociale' covering persons aged 65 and older. At the local level different schemes for people in need are available. In 2009 two temporary measures, the 'Bonus Famiglie' and the 'Social Card' were introduced. Due to the temporary nature these two are not accounted in the model and are also not available in the EU-SILC data. The 'Assegno sociale' amounts to EUR 409 per month, 13 months per year, for income not exceeding EUR 5,318 for a non-married person and twice this amount for a married couple. The benefit is paid on a differential basis and tax exempted.

Housing benefits are available for those who buy a residence as well as persons who rent it. Buyers are subsidized by a tax allowance for mortgage loan interests (up to EUR 4,000), rebates on the property transfer tax and low interest rates for loans. The rent allowance could either be a means-tested tax relief or rent subsidies for low income households. Rent subsidies are granted if taxable income of the household is below twice of the statutory minimum pension, i.e. EUR 11,521 and the rent exceeds 14 percent of the income. The tax allowance is available for different reasons (mainly housing, for people between the age of 20 and 30 in the first three years of residence and for workers who rent a second residence due to job reasons). In all these cases no credit is granted if income is higher than EUR 30,987. The tax credit decreases with income and ranges between EUR 150 and EUR 992. The highest allowance is available for persons between 20 and 30 years old, the lowest allowance in general cases. Eligibility conditions for and the level of the rent subsidy are determined at the regional level. The subsidy is not taxable.

There are three types of family benefits, a family allowance, a maternity allowance, and an allowance to households with at least three children. The family allowance is not only

granted to households with children but also to low-income couples with no children, as long as they are not self-employed or former self-employed retirees. The transfer covers different household types and varies also with respect to the level of income of the household. For lone parents with three and more dependants a supplementary family allowance is granted. The amount also depends on the level of income. The maternity allowance amounts to EUR 309 per month for five months and is granted to a mother whose wealth lies below a certain threshold or who is without income. Another scheme is granted at the national level and available for mothers who resigned their job during pregnancy and paid contributions for at least three months before resigning. Mothers receiving this benefit are not eligible for the maternity allowance on the local level. The allowance for households with at least three children below the age of 18 amounts to EUR 129 per month. The last two allowances are paid on a differential basis if means are too high to receive the full amount. All three allowances are tax exempt.

Netherlands

The social assistance guarantees a minimum income for persons who are no longer entitled to benefits under the social insurance schemes. Beneficiaries have to apply and accept jobs and must be registered with the local employment agency. Social assistance can also be provided to top up other benefits. The benefit is intended to cover the normal costs of living. The system differentiates three different minimum basic benefit payment rates. Couples receive 100 percent of the subsistence minimum, lone parent families 90 percent and single households 70 percent. The gross yearly benefit for a single household, inclusive holiday pay, amounts to EUR 14,775, for a lone parent EUR 18,449 and for couples EUR 19,197. Municipalities may provide an additional benefit of EUR 2,229 to stimulate work acceptance.

The housing benefit is restricted by minima and maxima and depends on taxable family income. Part of the rent is always paid by the household, and amounts to about EUR 210 ('standard rent'). Monthly rents up to EUR 648 qualify for benefits, for a full benefit only rents up to EUR 550 are accounted. Rents above this level are only subsidized by 50 percent. Households are eligible for benefits if their income is lower than EUR 20,975 (EUR 28,475) for a single younger than 65 (household in which the highest earner is younger than 65). For households with older persons the values are similar but lower. The benefit is not taxable.

In the Netherlands all children below the age of 18 qualify for child benefits. The amount of the benefit depends on the age of the child. For children born before 1995 also the size of the family is taken into account for the generosity of the benefit. A child counts for two children if it lives away from home. The benefit amounts to EUR 195 for a child with an age below five, EUR 237 for a child with an age between six and eleven and EUR 279 for an older child up to age 17. An additional benefit was introduced in 2008, which replaces the former child tax credit. This benefit can only be claimed if the family also receives the child benefit and the amount depends on family income and size. The maximum of the benefit

ranges from EUR 1,011 for one child up to EUR 1,611 for five or more children. The benefit is withdrawn at a rate of 6.5 percent if income exceeds EUR 29,914 and phases out with an income of EUR 45,111. The benefits are not taxable. Childcare is financed by employers, employees and the government. Childcare benefits are calculated from a share of the total costs of expenditures and decreases with the income level of the parents. The share is set to 95.5 percent for low-income parents (up to EUR 17,553) and decreases to one third for an income level above EUR 113,016 for the first child. For other children it decreases only to 85 percent for an income of more than EUR 162,936. Childcare benefits are not taxable.

Poland

The social assistance system in Poland consists of benefits from the social welfare system and social insurance institutions. Benefits from the social welfare system are granted to persons with insufficient means for living, amounting to PLN 477 monthly for a single and PLN 351 for a family member. The benefit could either be permanent (age, disability or permanent illness) or temporary (e.g. poverty, unemployment). Benefits from the social insurance institutions are payments to persons unable to work due to invalidity, which occurred already before an age of 18. The minimum benefit for temporary (permanent) benefits amounts to PLN 20 (PLN 30), the maximum to PLN 418 (PLN 477). The benefit from the social insurance institutions amounts to 84 percent of the minimum pension (PLN 567). Benefits are not taxable.

Housing benefits are paid at the local level to low-income households. The benefit is based on the difference between what is considered as reasonable expenditure for housing and actual housing costs. Housing costs cannot exceed a maximum amount depending on the household size and the size of the flat. Households have to cover housing costs by themselves to a certain amount, 15 percent of household income for a single household, twelve percent for a two to four person household and ten percent if five or more persons live in the household. To be eligible, household income must be below 175 percent of the minimum retirement pension for a single person and 125 percent for each person for families. If the income is higher only the difference between the income criteria and the benefit is paid. In 2008 the average housing benefit for a flat was PLN 147. The benefit is not taxable.

Family allowance is granted for children below the age of 18 (21 if the child is in education or 24 if disabled and in education). The family benefit is means-tested (in 2006 net income per person has to be lower than PLN 504). The family allowance depends on the age of the child and amounts to PLN 68 monthly for a child below the age of five, PLN 91 for a child between five and 18 years and PLN 98 for a child between 18 and 24 years. In addition, a birth supplement of PLN 1,000 per child and a child care supplement of PLN 400 per month for at most 24 months are granted. Additional supplements are available for single parents,

disabled children, large families and at the beginning of the school. Family benefits are also not taxable.

Sweden

Social assistance in Sweden is locally administered, means-tested and the beneficiary is required to actively search for a job. About 5.7 percent of the households have claimed social assistance for one or more months. The norm for social assistance is calculated annually and has an individual part (marital status, age of the child) and a household part (size of the household). The individual rate is SEK 2,800 for a single person and EUR 5,060 for a married couple. For each child the rate depends on the age and increases with the age, from SEK 1,520 for a child younger than one year to SEK 2,710 for a child between an age of 15 to 18. The household rate increases with the number of persons in the household, from SEK 880 to SEK 2,020 for a household with 7 persons. On top, support can also be provided for reasonable expenditures, like housing and electricity supply. The benefit is tax free.

Housing benefits for rented accommodations consist of the income-tested housing allowance, a supplement for social assistance claimants and an income-tested housing supplement for pensioners. The condition for receipt of the housing allowance is low-income and varies with the number of children. Most recipients are single parents. The housing benefit depends on age and the family status as well as the housing costs. For families with children between 50 and 75 percent of housing costs are paid. The housing benefit is not taxable.

For each child below an age of 16, or 20 if still in school, a child benefit is paid. The benefit is not means- nor income-tested and amounts to SEK 12,600 per child. Supplements are paid if the parents have more than one child. The supplement is SEK 1,200 for the second child, SEK 4,248 for the third child, SEK 10,320 for the fourth and SEK 12,600 for the fifth and all subsequent children. The benefit is not taxable.

Slovak Republic

Social assistance guarantees the provision of basic living conditions for citizens in material need and is income-tested. The following persons are jointly assessed, namely husband and wife, parents and their dependent children within one household and parents and their children up to the age of 25 if they live within one household and have no income. Eligible persons do not need to engage in job search activities. The benefits differ with respect to the number and type of jointly assessed persons. For example, a single person receives EUR 61, a childless couple EUR 105 and a couple with maximum four children EUR 158. For a pregnant woman (from the fourth month of pregnancy) and for persons with a child up to one year the benefit increases by EUR 14. In addition, health-care-, housing-, protective- and activation allowances are granted. Each person (children older than six years) being

jointly assessed receives a health care allowance amounting to EUR 2 per month. The housing allowance is set to EUR 56 for a single person and EUR 89 for a household with an additional jointly assessed person. The activation allowance (EUR 63 monthly) is provided for a person in material need and jointly assessed persons for measures which increase employability. The protective allowance (EUR 63 monthly) is granted for different living arrangements, like old-age, disability, lone parent with a child younger than 31 weeks, unfavourable health state and so on. Income reduces the benefit one by one, where income is modified to some extent. For example 25 percent of different forms of income are deducted for the income-test. The benefit is exempted from taxation. In addition, subsidies for food, materials and scholarships for pre-primary and primary schools are granted.

Housing allowances are provided for assistance of households in material need. A general scheme does not exist. The child allowance is paid up to the age of 16 of the child (25 for full-time vocational training and university students). The benefit is set to EUR 21 per child and month and is exempted from income taxation. For child-care, a parental allowance is granted up to the age of three years (six years for handicapped children) for proper care of the child. The allowance is set to EUR 164 monthly and is discharged from the income tax obligation.

United Kingdom

Income support provides help for persons whose net income falls below a minimum level and is means-tested. Persons with a capital above GBP 16,000 are not eligible. Savings from GBP 6,000 to 16,000 increase income by an assumed income of rent. In addition, the person is not allowed to work more than 16 hours per week (the partner 24 hours). Beneficiaries are not required to be ready for work. The allowance for a single amounts to GBP 64 per week (GBP 51 for a single between 18 and 24 years old), GBP 64 for a lone parent and GBP 101 for a couple. There exist further premiums for specific circumstances, like disability. The benefit is paid on a differential basis depending on the income of the claimant and the partner. An additional benefit is the 'Cold Weather Payment' amounting to GBP 25 for each week in which the average temperature is zero degree Celsius or below on seven consecutive days. Income Support is not taxable. Persons aged 60 and older are supported by a pension credit rather than income support. The benefit amounts to GBP 114 per week for a single person and GBP 174 for a couple.

Housing benefits are means-tested and provide assistance to pay the rent. The means-test is the same as for the income support. The housing benefit is determined by the eligible rent minus 65 percent of the difference between net resources and the applicable amount as long as neither income support nor income-based 'Jobseeker's Allowance' is received. For other claimants the housing benefit is the full amount of the eligible rent. Rules are determining the eligible rent of the local housing allowance (LHA), which were rolled-out nationwide in 2008. They apply to persons renting in the private sector and who make a new claim for housing

benefits. Under LHA the appropriate size is determined by the number of bedrooms. The 'Council Tax Benefit' is a means-tested benefit providing help towards taxes levied by the local authority. It is available for persons renting or buying their home. Both benefits are tax exempt. Homeowners cannot apply for the housing benefit, but can apply for a support of interest payments. Support can be claimed for credits aimed to purchase a property and to repair or improve it. The applied interest rate is the standard interest rate and help is limited to credits amounting to GBP 100,000.

A child benefit is available for each child under the age of 16 (19 if in full-time non-advanced education). The weekly amount of the benefit is GBP 20 for the oldest child and GBP 13 for each other child in the family. The child benefit is not means-tested and not taxable. In addition the 'Child Tax Credit' and 'Working Tax Credit' are granted, which are considered in the tax system.

2.14. Elasticities for Firm-Sponsored Training

As described in chapter 9 of Part II of Berger et al. (2009), i.e. the description of the LMM, the calibration of the firm-sponsored part of human capital production is based on two separate elasticities. The *first empirical elasticity* reflects on the impact of firm-sponsored training on the productivity of a worker. In particular, we relied on estimates by Dearden et al. (2006) who find that an increase in enrolment in training by one percentage point (in their dataset, around 14 percent undergo training) is associated with an increase of value added per worker by about 0.6 percent (and an increase of hourly wages by about 0.35 percent). The *second empirical elasticity* reflects on the sensitivity of the training decision of firms on changes of incentives. We relied on a figure reported in Bovenberg et al. (1998), who set the elasticity of on-the-job-training with respect to the marginal tax rate of the employer equal to -0.2 in their MIMIC model.

For the current project, we changed both elasticities, for several reasons. The estimate of Dearden et al. (2006) seems to be very high. They say that value added per worker increases by 0.6 percent if enrolment in training increases by 1 percentage point. Under the assumption that the productivity of an untrained worker is not affected by training of the other workers, i.e. there are no spillover effects of training, this would imply that the productivity of a trained worker increases by 66 percent, which seems to be a very high value, even more so if one takes into account average training costs per course. In a more recent paper, Konings and Vanormelingen (2009) estimate the impact of training on productivity by using Belgian firm-level data. In their preferred estimation, they find that the productivity premium of a trained worker is 23 percent, which still seems to be rather high. The wage premium of training is estimated at 12 percent. Therefore, we turned our focus on scientific papers on the wage effects of on-the-job training for the calibration of the elasticity. In particular, we rely on a recent meta-analysis of Haelermans and Borghans (2011). Their analysis reveals that wage effects reported in studies based on IV and panel estimators are substantially lower

than studies based on techniques that do not correct for selectivity issues. The main finding of this paper is that the average wage effect of on-the-job training is 2.6 per cent per course. We account for the fact that those studies which estimate both wage and productivity effects of training find that the impact on productivity is nearly twice as high as the impact on wages, so that a productivity premium of 4.5 percent seems to be a fairly reliable estimate, which is now used in the model. Furthermore, it should be noted that the last two numbers (wage premium of 2.6 percent and productivity premium of 4.5 percent) perfectly fit to a regression of Konings and Vanormelingen (2009) where they include firm fixed effects, which should pick up all unobserved worker heterogeneity. Even though this is not the authors' preferred specification, the approach of controlling for this unobserved heterogeneity is an appealing approach in our view.

Empirical evaluation of the effects of tax incentives on firm-sponsored training is very scarce. To our knowledge, the empirical validation of the elasticity from Bovenberg et al. (1998), which we have also used in the LMM up to now, was not very strong. In a recent paper, Görlitz (2009) analyses the impact of a training voucher program on firms' investment in further training. This policy in the German federal state of North Rhine-Westphalia increased incentives for small and medium sized firms by reducing training costs by up to 50 percent. The author finds that the share of establishments that invest in training increased by around 5 percentage points as a result of the policy reform. This result is robust to several different specifications and the methods used (difference-in-difference estimator; difference-in-difference-in-difference estimator) are state of the art and fairly reliable. For these reasons and because of the lack of additional estimates, we use this policy reform as a basis for the calibration of the second elasticity despite some concerns about the general validity of this estimate.[34]

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[34] We rely on only one empirical paper that analyses the impact 'only' for SMEs and 'only' for North Rhine-Westphalia.

3. List of Variables

LMM features several decisions of households and firms, contains heterogeneous households and includes a detailed modelling of institutional settings in the different countries. Thus, it is a rather complex model. This complexity requires a multitude of information from the represented countries and implies numerous parameters and variables in the model. This can lead to some intransparency, for instance when simulating a policy scenario or if the model shall be updated to implement new data. The aim of the list and description of variables is to improve the clarity of the programme code and of the data processing procedure and to facilitate the work with the program code for the responsible staff of the Commission and help them to perform the calibration procedure on their own.

Due to the vast number of variables in the programme code, a list of the parameters and variables used in the model facilitates working with the programme code considerably. A list of variables and a description of variables have already been provided in Part II, Section 8.2., of the Final Report of the original project. An improved list of variables is shown in Table 29 of our report, which is also provided as an Excel-file. This list of variables is complemented by a pdf-file providing a correspondence between the parameter or variable in the code and the same variable in the model documentation. Excel does not allow for the formula notation that would be necessary to provide this correspondence in a sufficient manner in a combined Excel table.

For all of the variables, we provide i) a short description of the function of the variable, ii) the type of the parameter or variable, iii) its dimension, and iv) the source for the code.

The column 'Type' deals with the issue that variables can be distinguished with respect to endogeneity, i.e. whether a variable is determined endogenously in the programme or determined outside the code. Exogenous parameters can be grouped further: they can either be assigned to institutional or policy parameters, which can be set differently in a reform scenario, or to a set of completely exogenous parameters like preference parameters or the depreciation rate of the capital stock. Nevertheless, even though these parameters are not policy parameters in a narrow sense, they can also be modified in a simulation, e.g. to simulate how a change of the depreciation rate might influence the economy. Furthermore, the model includes some 'technical terms' which help to improve the application of the model.

The column 'Dimension' specifies whether the variable is (in one particular period) a scalar or a matrix, which indicates that the value of the variable varies (potentially) for different age

and skill groups.[35] The column 'Source for Code' describes the way in which the variable is set. This can happen in three different ways in the model. First, the file 'param' contains parameters currently being the same for all countries, for example labour supply elasticities or the elasticity of intertemporal substitution. Second, the Excel-files '*DataInputXX.xlsx*' contain country specific data, for example the participation rate, the average number of hours worked or institutional parameters of the pension system. Simulations require setting the country code for which the simulation is performed in 'lmm.g'. Depending on the country code, the programme imports the country specific data from the relevant 'DataInputXX.xlsx' file. In addition to these two files, other variables are determined in the programme *code*. The term '*DataInput+Code*' indicates that the variable is initialised in the 'DataInputXX.xlsx' file, but will subsequently be changed in the simulation as a result of a policy reform as it is an endogenous variable. For instance, this includes labour market variables such as the unemployment or participation rate or the wage rate, or particular public revenues such as consumption or income tax revenues. On the other hand, the term '*DataInput+Calib*' indicates that a variable is initialised in the 'DataInputXX.xlsx' file, but is subsequently adjusted in the calibration procedure (in the 'calib' file). For instance, the age- and skill-specific structure of the income tax rate 'tw' is set in the 'DataInputXX.xlsx' file. Adjacently, these tax rates are adjusted in the 'calib' file in order to get the right amount of public revenues.

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[35] For some variables, we include additional information in brackets. For instance, the entry for the human wealth (hwv) is 8x3 (5x3). This means that the variable is a 8x3-matrix in the programme code but that only 5x3 entries are different from zero (as human wealth is zero for retirees).

Table 29: List of Variables

General Economic Parameters				
Parameter/Variable	Description	Type	Dimension	Source for Code
gx	exogenous real growth rate	parameter	scalar	DataInput
r	exogenous real interest rate	parameter	scalar	DataInput
rr	gross interest rate (1+r)	parameter	scalar	Code
rrtau	interest rate after capital income taxes (1+(1-t^{CB})*r)	parameter	scalar	Code
delta	depreciation rate of capital	parameter	scalar	DataInput
Production				
Parameter/Variable	Description	Type	Dimension	Source for Code
y	production function	endogenous variable	scalar	Code
gva	gross value added	endogenous variable	scalar	Code
gdp	gross domestic product	endogenous variable	scalar	Code
tb	trade balance	endogenous variable	scalar	Code
k	capital stock	endogenous variable	scalar	Code
ld	labour demand	endogenous variable	5x3	Code
lsk	labour demand (aggregate for skill)	endogenous variable	1x3	Code
l	labour demand (aggregate)	endogenous variable	scalar	Code
mpl	marginal labour productivity (of each skill)	endogenous variable	1x3	Code
mpk	marginal productivity of capital	endogenous variable	scalar	Code
lam_k	Tobin's marginal q	endogenous variable	scalar	Code
i	physical investment	endogenous variable	scalar	Code
j	investment installation costs function	endogenous variable	scalar	Code
psi	scaling factor of the investment installation costs function	parameter	scalar	param
firmskillcost	costs for firm-sponsored training	endogenous variable	5x3	Code
div	dividend payments to owners	endogenous variable	scalar	Code
firmrent	firm rents	endogenous variable	scalar	Code
vk	firm value caused by the capital stock	endogenous variable	scalar	Code
ve	firm value caused by rents	endogenous variable	scalar	Code
vf	firm value (vk+ve)	endogenous variable	scalar	Code
Preferences				
Parameter/Variable	Description	Type	Dimension	Source for Code
beta	subjective discount factor	parameter	scalar	Code
sig	elasticity of intertemporal substitution	parameter	1x3	param
mpc	marginal prospensity to consume	endogenous variable	8x3	Code
oomv	factor considering the MRS across age groups	endogenous variable	8x3	Code
effcost	disutility of number of hours worked or spent in training	endogenous variable	5x3	Code
searchcost	disutility of search effort	endogenous variable	5x3	Code
delparcost	disutility of participation	endogenous variable	5x3	Code
phibarcost	total' disutility of households	endogenous variable	5x3	Code
homeu	value of home production of an unemployed person	parameter	5x3	Code
homepar	value of home production of an inactive individual	parameter	5x3	Code
Stock, Wealth and Consumption Variables of Households				
Parameter/Variable	Description	Type	Dimension	Source for Code
av	asset stock	endogenous variable	8x3	Code
p	amount of claims to pension system (equals pension benefit)	endogenous variable	8x3	Code
sv	pension wealth	endogenous variable	8x3	Code
theta	average productivity per age-skill-group	endogenous variable	5x3	Code
thetaind	average individual productivity per age-skill-group	endogenous variable	5x3	Code
thetafirm	productivity resulting from firm-sponsored training	endogenous variable	5x3	Code
hefffirm	amount of firm-sponsored training	endogenous variable	5x3	DataInput+Code
hwv	human wealth (pres. Value of labour related income)	endogenous variable	8x3 (5x3)	Code
trans	transfer wealth	endogenous variable	8x3	Code
cv	private consumption	endogenous variable	8x3	Code
qv	effort-adjusted private consumption	endogenous variable	8x3	Code

Table 29 (Contd.): List of Variables

Income Variables				
Parameter/Variable	Description	Type	Dimension	Source for Code
yv	total labour related income net of taxes	endogenous variable	8x3	Code
wdv	effort-adjusted labour related income net of taxes	endogenous variable	8x3	Code
wagev	gross wage rate (per productivity unit)	endogenous variable	5x3	Code
wv	gross wage rate (wagev*theta)	endogenous variable	5x3	DataInput+Code
inc_gross	gross labour income	endogenous variable	5x3	Code
inc_net	labour income net of taxes	endogenous variable	5x3	Code
baeff	unemployment insurance income	endogenous variable	5x3	Code
lump	lump sum transfers to households	policy parameter	8x3	DataInput
zw	social assistance paid to workers	policy parameter	5x3	DataInput
zu	social assistance paid to unemployed individual	policy parameter	5x3	DataInput
ynonpar	social assistance for inactive individual	policy parameter	4x3	DataInput
sev	severance payments (as share of gross labour income)	policy par./end. var.	5x3	Code
factau	factor to correct the assessment base for severance payments	policy parameter	5x3	param
p00	flat pension payments	policy parameter	8x3 (4x3)	DataInput
ee	pension benefit net of taxes	endogenous variable	8x3 (4x3)	Code
pp	gross pension benefit	endogenous variable	8x3 (4x3)	Code
ppearly	disability pension benefit	endogenous variable	5x3	Code
p00early	flat disability pension benefit	policy parameter	8x3 (5x3)	DataInput
transhouse	inter-vivo transfers to households	endogenous variable	8x3	Code
ytil	technical income term simplifying notation	technical term	5x3	Code
sbar	technical income term simplifying notation	technical term	5x3	Code

Labour Market Variables of Households				
Parameter/Variable	Description	Type	Dimension	Source for Code
eff	number of hours spent working	endogenous variable	5x3	DataInput+Code
heff	number of hours spent training	endogenous variable	5x3	DataInput+Code
effagg	total number of hours spent working or training	endogenous variable	5x3	Code
deltapar	participation rate	endogenous variable	5x3	DataInput+Code
deltabar	share of individuals not disabled	exogenous variable	8x3	DataInput
empl	probability of having a job without searching	exogenous variable	5x3	DataInput+Calib
search	individual search intensity for a job	endogenous variable	5x3	Code
find	probability of finding a job per unit of search intensity	endogenous variable	5x3	Code
hir	probability of being employed (before firing decision)	endogenous variable	5x3	Code
u	unemployment rate	endogenous variable	5x3	DataInput+Code
hheff	argument of the human capital production function	endogenous variable	5x3	Code
hinv	production' function of human capital	endogenous variable	5x3	Code
deltah	depreciation rate of human capital	parameter	5x3	Code

Matching Variables				
Parameter/Variable	Description	Type	Dimension	Source for Code
reswagefirm	outside option of the firm in wage bargaining	endogenous variable	5x3	Code
reswagework	outside option of the worker in wage bargaining	endogenous variable	5x3	Code
barg	bargaining power of the firm	parameter	1x3	param
aggsearch	aggregate search units per age-skill-group	endogenous variable	5x3	Code
vac	number of vacancies	endogenous variable	5x3	Code
kappa	vacancy costs	endogenous variable	5x3	Code
fill	probability of filling a vacancy	endogenous variable	5x3	Code
muv	labour market tightness	endogenous variable	5x3	Code
matching	number of matches	endogenous variable	5x3	Code
lh	number of workers that have a job before firing	endogenous variable	5x3	Code
prob	probability of keeping a worker	endogenous variable	5x3	Code
probcost	managerial effort costs	endogenous variable	5x3	Code

Table 29 (Contd.): List of Variables

Shadow Prices				
Parameter/Variable	Description	Type	Dimension	Source for Code
lam_til	shadow price of pension claims (relative to shad. pr. of assets)	endogenous variable	8x3	Code
chi_til	shadow price of labour prod. (relative to shad. pr. of assets)	endogenous variable	8x3	Code

Public Sector				
Parameter/Variable	Description	Type	Dimension	Source for Code
cg	public consumption	policy parameter	scalar	Code
factctotcg	share of public consumption taxed by consumption taxes	policy parameter	scalar	DataInput
trssc	public transfer to the public social security system	endogenous variable	scalar	Code
expenu	total unemployment payments paid to individuals	endogenous variable	scalar	Code
expenpens	total pension payment to individuals	endogenous variable	scalar	Code
dg	government debt	endogenous variable	scalar	Code
prim_bal	primary balance of the general budget	endogenous variable	scalar	Code
reven	total revenues of the general budget	endogenous variable	scalar	DataInput+Code
expen	total expenditures of the general budget	endogenous variable	scalar	Code
reventindiv	taxes on capital gains	endogenous variable	scalar	DataInput+Code
revenfiring	firing taxes	endogenous variable	scalar	Code
revenssc	social security contributions	endogenous variable	scalar	DataInput+Code
reventax	income tax revenues	endogenous variable	scalar	DataInput+Code
revencons	consumption tax revenues	endogenous variable	scalar	DataInput+Code
expenz	public lump sum transfers and social assistance	endogenous variable	scalar	DataInput+Code
ch	public health expenditures	policy parameter	scalar	DataInput

Statutory Taxes of Households				
Parameter/Variable	Description	Type	Dimension	Source for Code
twp	average income tax rate for pension payments	policy parameter	4x3	DataInput+Calib
ttotp	average retiree's social security contribution rate	policy parameter	4x3	DataInput+Calib
1-taxp	average tax wedge for pension benefits	policy parameter	4x3	Code
xtaxp	share of ssc of retirees deductible from income tax	policy parameter	4x3	DataInput
1-taxearly	average tax wedge for disability pension benefits	policy parameter	5x3	Code
taxtau_s	average income tax rate for severance payments	policy parameter	5x3	DataInput
tw	average income tax rate for workers	policy parameter	5x3	DataInput+Calib
twsocass	average 'social assistance tax rate' for workers	policy parameter	5x3	DataInput
twtot	tw+twsocass	policy parameter	5x3	Code
ttotw	average employee's social security contribution rate	policy parameter	5x3	DataInput+Calib
1-taxw	average tax wedge of worker	policy parameter	5x3	Code
xtaxw, xtaxearly	share of ssc of workers/disabled deductible from income tax	policy parameter	5x3	DataInput
tu	average income tax rate of unemployed	policy parameter	5x3	DataInput+Calib
ttotu	average social security contribution rate of unemployed	policy parameter	5x3	DataInput+Calib
1-taxu	average tax wedge of unemployed	policy parameter	5x3	Code
pc	price index of priv. consumption (including cons. tax)	policy parameter	8x3	DataInput+Calib
tindiv	capital gains tax rate	policy parameter	scalar	DataInput+Calib

Effective and Implicit Tax Rates				
Parameter/Variable	Description	Type	Dimension	Source for Code
gainu	effective gain in unemployment insurance	technical term	5x3	Code
gainp	effective gain in pension insurance	technical term	5x3	Code
gainsev	effective gain in severance payments	technical term	5x3	Code
1-taxhat	effective average tax wedge	technical term	5x3	Code
gamtax	technical 'tax' term for simplification	technical term	5x3	Code
taxpart	implicit tax rate on participation/retirement	technical term	5x3	Code

Table 29 (Contd.): List of Variables

Taxes of Firms				
Parameter/Variable	Description	Type	Dimension	Source for Code
tau_s	tax rate for severance payment	policy parameter	5x3	DataInput+Calib
tau_f	firing tax rate	policy parameter	5x3	DataInput+Calib
tau_c	administrative firing cost rate	policy parameter	5x3	DataInput+Calib
tau	total firing cost tax rate	policy parameter	5x3	Code
subld	employment subsidies or flat taxes per employed person	policy parameter	5x3	DataInput
subtrain	subsidies to firm-sponsored training	policy parameter	5x3	DataInput
ttotf	average total employer's social security contribution rate	policy parameter	5x3	DataInput+Calib
tprof	corporate income tax rate	policy parameter	scalar	DataInput
subi	rate of tax allowance for physical investment	policy parameter	scalar	DataInput
tcap	tax rate on the capital stock	policy parameter	scalar	DataInput+Calib
taxfirm	total tax payments of firms (excluding firing taxes)	policy parameter	scalar	Code
Institutional Variables				
Parameter/Variable	Description	Type	Dimension	Source for Code
pinc	indexation of pension claims	policy parameter	8x3	DataInput
mp	pension accrual rate of labour income	policy parameter	5x3	DataInput
m1	pension accrual rate independent of labour income	policy parameter	5x3	DataInput
b1	consideration of unemployment periods for pension benefits	policy parameter	5x3	DataInput
pensinv0	'correction' for public disability pensions	policy parameter	5x3	Code
sigpens	Gruber-Wise discounts and surcharges of pension claims	policy parameter	1x3	DataInput
corrp	statutory retirement age	policy parameter	1x3	DataInput
vabzug	adjustment factor for public pension payments	technical term	8x3	DataInput
va1	adjustment factor in old age pension system	technical term	8x3	DataInput
va2	adjustment factor in disability pension system	technical term	8x3	DataInput+Calib
brepl	unemployment replacement rate of earnings-related benefits	policy parameter	5x3	DataInput
b0eff	unemployment payment not indexed to previous earnings	policy parameter	5x3	DataInput
xi1	share of unempl. payments indexed to previous earnings	policy parameter	5x3	DataInput
Demographic Variables				
Parameter/Variable	Description	Type	Dimension	Source for Code
gamv	probability of surviving	parameter	8x3	DataInput
omv	probability of staying in the same age group	parameter	8x3	Code
nv	number of individuals in an age-skill group	endogenous variable	8x3	Code
skill_distributionnb	share of new entrants of different skill types	endogenous variable	1x3	DataInput+Code

4. Model Application

4.1. Introduction

The aim of this chapter is to provide a good overview about simulation results of different policy reforms. As the model has several features, one single simulation can not reveal all impacts on the behaviour of households and firms. For this reason, we decided to run three different simulations and discuss the behaviour of the economic agents. In that way, we can provide first insights on how the results of the model differ between the countries. As the equations of the model are exactly the same for all the countries, the differences follow from various institutional settings and other economic differences which are a result of the calibration. The three simulations especially deal with the labour market, the main focus of the model. Two of them are linked to the impact of the tax- and social security contributions systems on the labour market and the third with human capital. In particular, we analyse i) an increase of income tax rates so that revenues increase by 0.5 percent of GDP; ii) a cut of employers' social security contribution rates for low-income workers so that revenues decrease by 0.5 percent of GDP and iii) a subsidy to firm-sponsored training with costs amounting to 0.3 percent of GDP. We think that these scenarios are a good selection in order to explore the various outcomes in the modelled countries. To a minor extent, they also allow for a comparison with the results of the previous study for DG EMPL, namely 'Modelling of Labour Markets in the European Union', as some simulations, which are related to the simulations performed in this Final Report, were already performed in the previous project.

A discussion of the effects of policy reforms on major macroeconomic indicators, such as GDP, private consumption, employment, physical investment or unemployment rates, will reveal possibly different outcomes in the countries modelled. In the following analysis, we will mainly concentrate on the effects on the labour market. The main interest is how much these policy reforms contribute to labour market and economic outcomes in the respective member countries and to which extent the outcomes differ as a matter of different settings. However, one has to be cautious when interpreting the results. As the initial situation is different in each country, the reform scenarios are not exactly the same. In the tax- and social security contributions scenarios, for example, either tax rate changes or the overall budgetary impact can be the same in all countries, but not both.[36] This should be taken into account if one compares the results across countries.

Given the enormous amount of information the model provides, we start our analysis with the steady state results of the simulations only, i.e. we initially focus on the long-run outcomes, in which all behavioural adjustments are finished. Some decisions (especially investment decisions) will not happen overnight so that adjustments may take several years such that

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[36] For instance, if we apply the same change of social security contribution **rates** to all countries in the model, the **budgetary impact** would be more pronounced in those countries with a higher share of low-skilled individuals.

the economy moves from one state to another. The long-run results are presented in a Table and in Figures for the most important variables of interest. This analysis is followed by a discussion of short- and medium-term properties of the LMM.

4.2. Income Tax

4.2.1.   Introduction

The income tax is one of the most important sources of government financing in most of the countries. An overview about the share on tax revenues is presented in Figure 1. On the one hand, the aim of the tax is to provide funds for the government to finance outlays, on the other hand it redistributes income in the sense that people with higher income contribute more to correct the distribution based on market outcome. This might reflect preferences of the population. However, the income tax also has distortionary effects. It influences the decisions of households and firms, such that the economic outcome in the economy is different to a situation without taxes. Most importantly, the income tax influences wage bargaining between firms and employees, it influences investment incentives and labour supply of private households and labour demand of firms. Besides, it has an effect on human capital decisions and on private consumption.

The financial situation of public households in nearly all European countries is very tight at the moment. Public debt increased significantly due to the recent financial and economic crisis. Apart from that, the social systems will exert additional pressures on public finances due to demographic change in the future. For these reasons, lower expenditures and/or additional revenues will be needed to balance budgets to relax financial tightness. One way to raise additional funds could be higher income taxes. For this reason we simulate the impact of an increase of income tax rates in all the countries.

4.2.2.   Policy Scenario

In this policy scenario we increase tax rates for all groups, comprising labour income, unemployment income, retirement and early retirement income as long as these different forms of income are taxed initially. Tax exempted income remains exempted. We **adjust the income tax proportionally** meaning that all these rates are multiplied by the same factor. This implies that the income tax rate rises by absolutely more if the initial tax rate is higher. For instance, the absolute increase of the tax rate of people with high income is stronger than for people with low income, which increases the progression of the income tax system. The factor is determined in such a way that **additional revenues amount to 0.5 percent of GDP ceteris paribus**, i.e. we assume that economic agents do not adjust their behaviour for the calculation of this factor. This method is sometimes called 'static scoring' in the economic literature. In the simulation, such an adjustment will lead to lower additional revenues as projected as agents are influenced by the higher income taxes. The reform scenario differs

for the countries as tax rates for the various age- and skill-groups are different in the initial situation as well as different sources of income are treated differently from a tax perspective.

4.2.3. General Economic Impact

In most countries, a large part of the tax wedge between labour costs and net labour income is the income tax. Since employees can shift a part of the tax increase to firms via wage bargaining, the increase decreases net income but also raises labour costs of firms. The impact of a change of the income tax rate on wages depends on the wage bargaining between firms and workers. The reform decreases the job rent, meaning that total value added of a worker is divided between three groups, employee, employer and government. The tax increase implies that the claim of the government rises at the cost of the other two groups. Wage bargaining determines how much of the additional claim of the government is borne by the employer by higher labour costs and how much employees lose by lower net income. In general, low-skilled workers are less affected by the increase of the tax rate than high-skilled workers as the tax rate of the latter group rises by more.

On the one hand, higher gross wages and therefore labour costs reduce the amount of vacancies firms offer. In addition, they increase the lay-off rate of firms such that labour demand of firms decreases. On the other hand, lower net wages imply less labour supply of private households. The reduction of labour supply arises along several margins. First, the decrease of the net wage per hour leads to a reduction of the number of hours worked, meaning that private households substitute labour for leisure. Second, it has an impact on the decision whether to participate on the labour market or not. A reduction of labour income implies that participation decreases on average. Third, it influences the search intensity of unemployed persons for a job. In the case of being unemployed, persons compare labour with replacement income such that less labour income, keeping the unemployment replacement income the same, will diminish the intensity to which an unemployed person searches for a job. The impact on the search intensity also depends on how unemployment benefits are affected by this reform. This is also taken into account for the participation and retirement decision. Higher taxation of labour income will induce persons to stay away from the labour market. If the tax burden of other sources of income (e.g. pension benefits) generated outside the labour market is also higher as result of the reform then the participation effect will be lower.

Given the negative employment effects, the increase of the income tax rate also has negative effects on investment incentives as the capital labour ratio would rise implying that some investments will not be profitable anymore. The adjustment of investment reduces the capital stock in the economy.

Given lower labour demand and labour supply, the implication of the reform is that the employment level decreases. At the first sight, one would expect a higher impact for older

and high-skilled workers as the tax rate changes more pronouncedly for these groups. However, capital-skill complementarity in the production function implies that the capital stock reacts to changes of high-skilled workers leading to pronounced employment and unemployment effects for low- and medium skilled workers as well.

Considering all these consequences of the reform, disposable income of private households decreases. The higher taxation leads to less labour income and also to lower individual social benefits in most cases as long as social benefits depend on previous labour income. For example, pension and unemployment benefits are related to labour income at least to some extent in most countries. Lower disposable income of private households implies a decrease of private consumption. Even if additional public revenues resulting from the tax increase would be reimbursed to private households, private consumption would decrease due to the negative economic impact on the reform.

As long as the impact of lower growth on public finances will not outweigh the additional revenues, the reform will increase tax revenues. In this simulation we assume that the government uses additional resources to finance unproductive public consumption. This allows us to analyse the pure economic effect of the reform without having to discuss effects of different expenditure categories. In general, we expect that additional resources will be considerably lower than a ceteris paribus view would suggest. The employment effect negatively affects revenues of taxes and social security contributions on labour. The negative impact on private consumption lessens revenues from consumption taxes. In addition, benefits to private households will rise due to the effect on unemployment, participation and retirement. The revenue share, i.e. revenues actually generated compared to revenues in a ceteris paribus situation (0.5 percent of GDP), therefore depends on the economic impact of the tax increase and on the institutional system, like unemployment or pension system. The simulation results for the modelled countries are presented in the following subsections. We start with a comparative static analysis, which is followed by a discussion of short- and medium-term effects.

4.2.4. Comparative Static Results

The simulation shows that there are significant country differences of the reform, but the effect on GDP is considerably negative in all countries. The impact on GDP ranges from -0.71 percent in Spain to -0.46 percent in Finland and Sweden. The unweighted average of the reform amounts to -0.56 percent (the unweighted average is indicated by the red line in all the figures). In the Southern countries, the Czech Republic and the Netherlands, the impact is stronger than in the other countries. The impact on employment is less pronounced than the impact on investment or capital stock respectively. Employment (defined as the number of workers) decreases by 0.3 to 0.5 percent whereas the capital stock effect is found to be between 0.5 percent to 0.85 percent. The unweighted averages for these variables are 0.37 percent and 0.61 percent. On average, the investment effect is more than 50 percent

stronger than the employment effect. This result holds in each country and follows from capital-skill-complementarity. As high-skilled persons are more heavily affected, the level of investment decreases by even more than employment. Furthermore, the impact on 'effective employment', which represents the total number of hours worked in the economy, is more pronounced than the impact on employment, which results from the fact that intensive labour supply decreases as well. The reverse result can be found in the following scenario, in which we decrease social security contributions for low-income employees. The impact on GDP, employment and investment is shown in Figure 2, Figure 3 and Figure 4.

Figure 2: GDP, Income Tax Reform
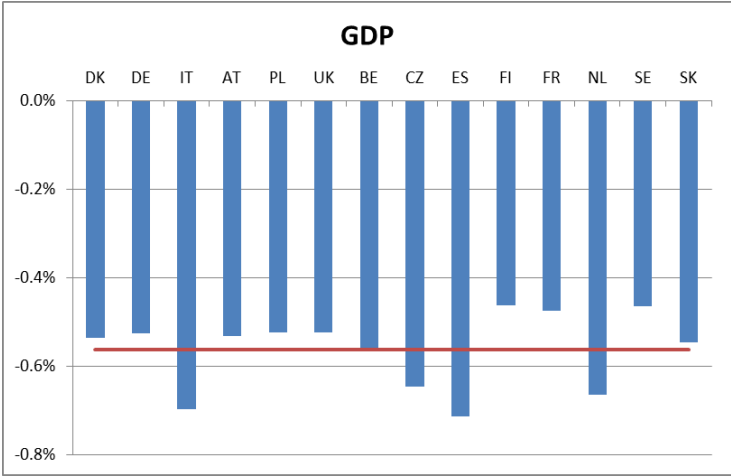
Figure 3: Employment, Income Tax Reform

There is a strong correlation between the impact on employment and GDP. In most countries, the impact on employment and GDP can be described by a linear relationship. Only in the Netherlands, the impact on GDP is much more pronounced than the impact on employment. The reason for this effect is the skill choice. The skill-shift towards low-skilled persons is much more pronounced than in other countries. This is, inter alia, caused by a rather progressive initial tax system, so that the reform is particularly strong for high-skilled

individuals in the Netherlands. This implies a stronger effect on GDP than on employment as productivity of low-skilled workers is significantly lower than that of high-skilled persons.

Figure 4: Investment, Income Tax Reform
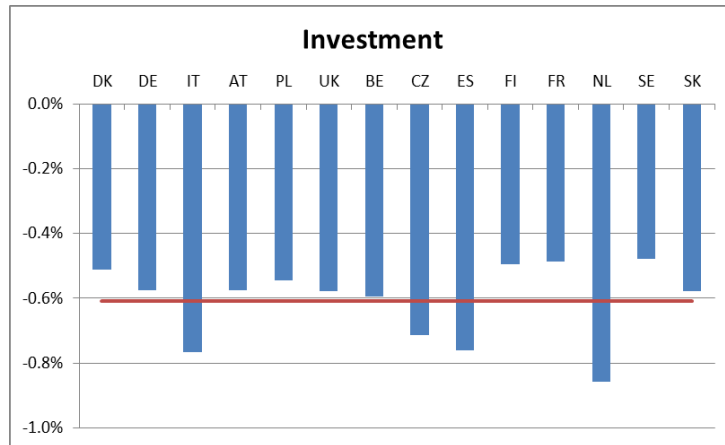
Figure 5: Employment (in percent) and GDP (in percent), Income Tax Reform
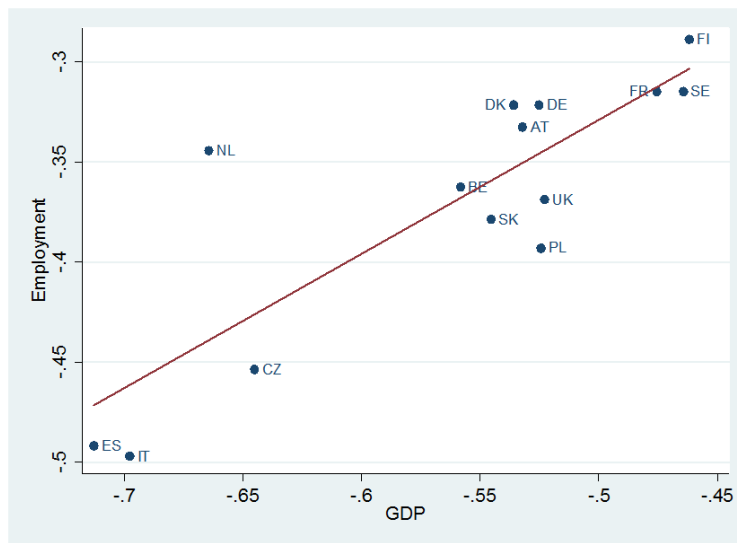
The rather high employment and output effect in Spain and the Czech Republic can be explained by the fact that the capital share is significantly higher in these countries than in other countries implying that the reform in percent of labour costs is higher than in the remaining countries. This is also reflected in the wage changes. Although gross wages increase more pronouncedly than in other countries, there is an even higher decrease of net wages. The rather low impact in Finland, France and Sweden is also a result of the skill-

choice, which can, again, be attributed to a relatively non-progressive income tax system. The proportion of high-skilled persons changes by much less than in other countries such that the output, but also employment effect, is considerably lower. If the skill-choice decision is 'switched off', the effect is similar to the one in the other countries. The strong output but also employment effect in Italy can be explained by the relatively higher effect of the reform on participation, which decreases by far the most of all countries such that the overall impact of higher taxes is very strong. The large impact on participation is a result of the comparably severe reduction of the retirement age.

The investment and therefore capital stock reaction follows the GDP and also employment effect to a large extent in all countries. Nevertheless, the investment effect is stronger than the impact on employment as the tax increase is more concentrated on high-skilled persons such that investment declines by more than employment. Again, the impact differs in the Netherlands. As the skill-composition towards the low-skilled changes by more in the Netherlands, investment incentives decline relatively more such that the GDP effect is rather high.

Figure 6: Investment (in percent) and GDP (in percent), Income Tax Reform
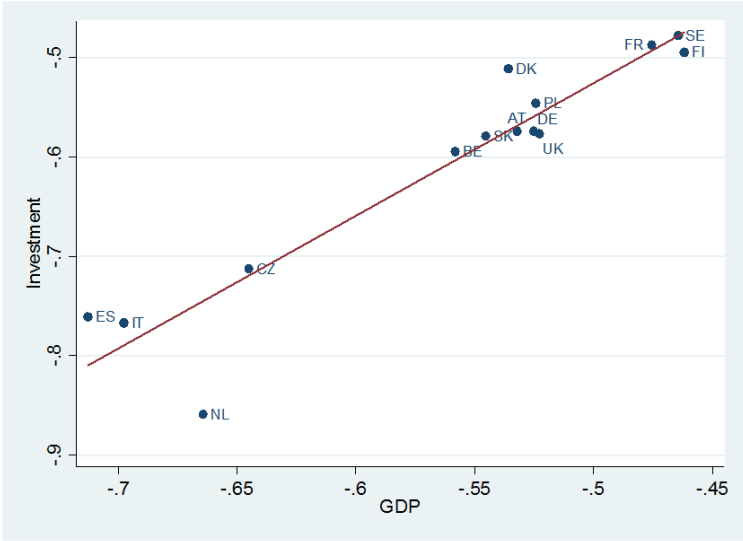
The reform has a negative impact on participation as well as on employment. From a theoretical point of view, the participation effect could outweigh the employment effect such that the unemployment rate decreases. However, this is not the case in any of the countries. The unemployment rate increases in all simulations with a range from 0.1 percentage points to 0.2 percentage points. The unweighted average increase amounts to 0.13 percentage points. The change of the unemployment rate is shown in Figure 7.

One could ask whether there is a link between the employment and unemployment effect. Figure 8 shows that there is no strong link between employment and the unemployment rate

in this simulation. This is not really surprising as the reform has an impact on several different margins, such as skill-choice, participation or wage effects. Overall, there is no statistically significant correlation between these two variables. The unemployment effect is rather similar in all countries with the exception of Spain and Netherlands. The strong increase in the Netherlands is the result of the pronounced skill-shift. Low-skilled persons have a much higher unemployment rate than higher-skilled persons such that the strong skill-shift towards low-skilled in the Netherlands leads to the high increase of the average unemployment rate. In Spain, the comparably larger reform volume again leads to this impact on the unemployment rate.

Figure 7: Unemployment Rate (in pp), Income Tax Reform
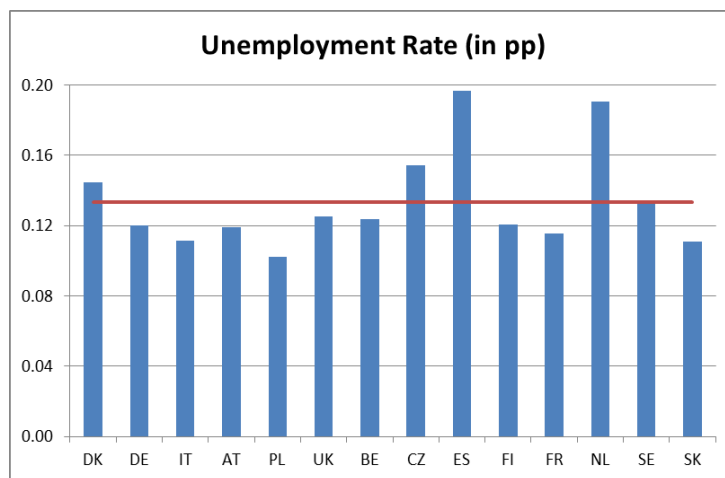
Figure 8: Employment (in percent) and Unemployment (in pp), Income Tax Reform
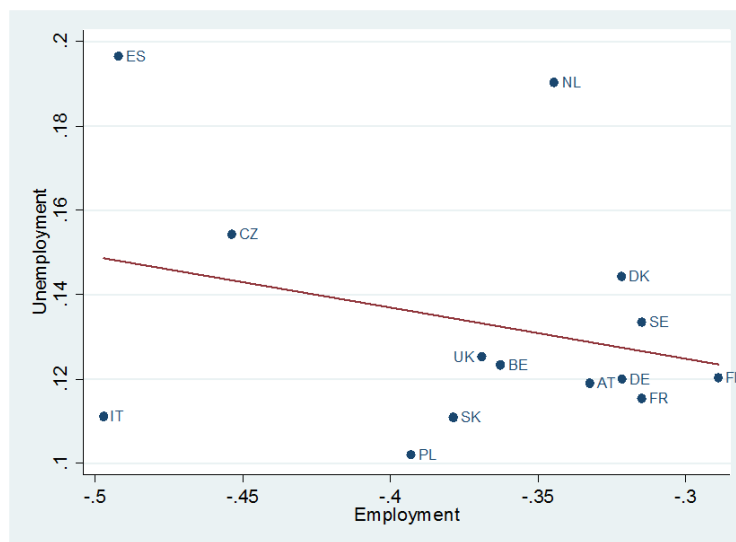
The reform has a negative impact on disposable income of private households. Additional government revenues are assumed to be spent in unproductive government spending and are not redistributed to private households. The change in private consumption ranges

from -1.06 percent to -1.43 percent with an unweighted average of -1.22 percent. The change in private consumption in the modelled countries is presented in Figure 9. The variation of private consumption is less than the variation of the GDP effect. The reason for this is that income is influenced by the higher ceteris paribus taxes amounting to 0.5 percent of GDP in each country as well as the negative influence on economic activity. The first effect is the same in each country such that the impact on private consumption is smoother.

Figure 9: Private Consumption, Income Tax Reform
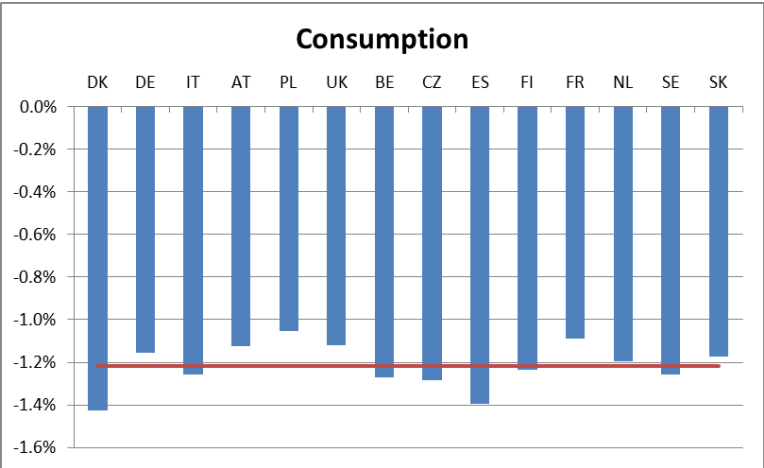
Figure 10: Revenue Share, Income Tax Reform
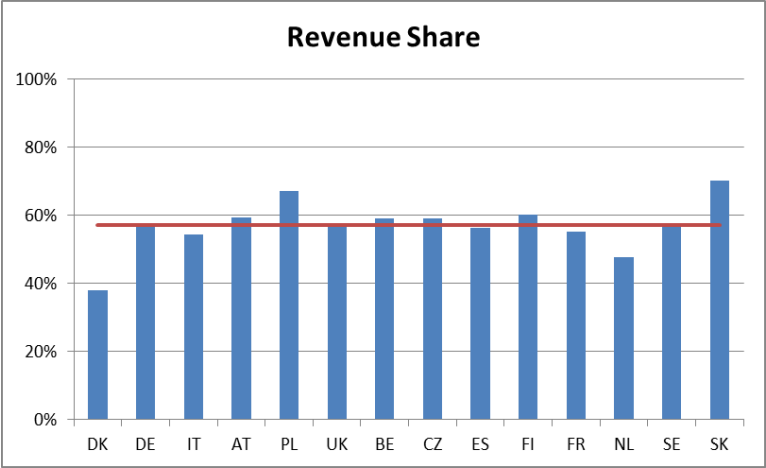
The effect on the revenue share is very different in the countries. It ranges from 38 percent in Denmark to 70 percent in Slovakia. The unweighted average amounts to 57 percent. This means that, on average, public finances improve by 0.28 percent of GDP instead of the intended 0.5 percent. For most countries the revenue share lies between 55 percent and 60 percent as presented in Figure 10. Figure 11 indicates that there is a small negative correlation between the revenue share and the initial tax share in percent of gross value added in the countries. For example, if employment decreases by the same amount in two countries and wages are affected in the same way, public revenues should be affected

according to the tax burden on labour in these countries. This implies that the revenue share is lower if the initial tax share is higher. A second argument is related to the public pension system. If pension benefits are earnings-related, lower earned income also leads to lower pension benefits and, ceteris paribus, to less public expenditures. If they are not earnings-related, the impact on pension expenditures will be more moderate. This fact contributes to the rather low revenue share in Denmark.

Figure 11: Tax Ratio and Revenue Share, Income Tax Reform
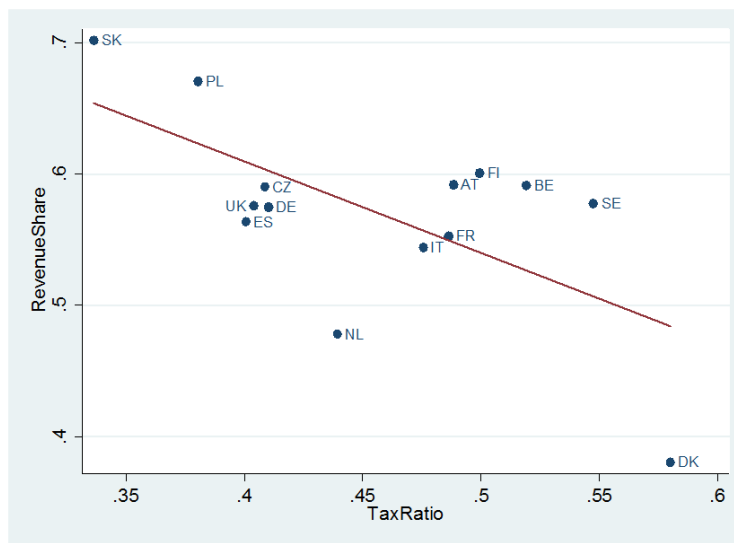
Table 30: Steady State Results of the Income Tax Reform

Income Tax Reform	DK	DE	IT	AT	PL	UK	BE	CZ	ES	FI	FR	NL	SE	SK	min	max	Avg
GDP	-0.54%	-0.53%	-0.70%	-0.53%	-0.52%	-0.52%	-0.56%	-0.65%	-0.71%	-0.46%	-0.48%	-0.66%	-0.46%	-0.55%	-0.71%	-0.46%	-0.56%
Capital Stock	-0.51%	-0.57%	-0.77%	-0.57%	-0.55%	-0.58%	-0.59%	-0.71%	-0.76%	-0.49%	-0.49%	-0.86%	-0.48%	-0.58%	-0.86%	-0.48%	-0.61%
Consumption	-1.43%	-1.16%	-1.26%	-1.12%	-1.06%	-1.12%	-1.27%	-1.28%	-1.39%	-1.24%	-1.09%	-1.20%	-1.26%	-1.17%	-1.43%	-1.06%	-1.22%
Trade Balance (change in % of GDP)	0.02%	-0.03%	-0.12%	-0.06%	-0.09%	-0.02%	-0.12%	-0.10%	-0.07%	-0.06%	-0.04%	-0.11%	-0.09%	-0.07%	-0.12%	0.02%	-0.07%
Gross wage rate (Labour costs per hour)	0.02%	0.06%	0.07%	0.06%	0.08%	0.06%	0.09%	0.15%	0.12%	0.05%	0.07%	0.01%	0.10%	0.12%	0.01%	0.15%	0.07%
-low	-0.14%	-0.15%	-0.15%	-0.15%	0.03%	-0.12%	-0.13%	-0.11%	-0.06%	-0.10%	0.03%	-0.53%	-0.03%	-0.04%	-0.53%	0.03%	-0.12%
-medium	-0.02%	-0.14%	0.07%	-0.07%	-0.05%	-0.06%	-0.05%	-0.04%	-0.05%	-0.15%	-0.07%	-0.36%	0.00%	-0.04%	-0.36%	0.07%	-0.08%
-high	0.17%	0.50%	0.57%	0.56%	0.30%	0.31%	0.37%	0.87%	0.45%	0.30%	0.28%	0.80%	0.28%	0.68%	0.17%	0.87%	0.46%
Net wage rate	-1.32%	-1.19%	-1.04%	-1.12%	-0.89%	-0.99%	-1.10%	-1.39%	-1.37%	-1.23%	-1.04%	-1.22%	-1.15%	-1.20%	-1.39%	-0.89%	-1.16%
-low	-1.23%	-0.83%	-0.90%	-0.76%	-0.73%	-0.84%	-0.95%	-0.99%	-1.06%	-1.08%	-0.94%	-0.90%	-1.04%	-0.87%	-1.23%	-0.73%	-0.94%
-medium	-1.29%	-1.21%	-1.06%	-1.15%	-0.94%	-1.00%	-1.11%	-1.40%	-1.43%	-1.22%	-1.12%	-1.15%	-1.13%	-1.19%	-1.43%	-0.94%	-1.17%
-high	-1.36%	-1.17%	-1.07%	-1.14%	-0.78%	-1.00%	-1.14%	-1.31%	-1.55%	-1.23%	-0.96%	-1.28%	-1.20%	-1.21%	-1.55%	-0.78%	-1.17%
Average number of hours worked per worker	-0.11%	-0.09%	-0.08%	-0.09%	-0.07%	-0.09%	-0.09%	-0.11%	-0.11%	-0.10%	-0.09%	-0.08%	-0.10%	-0.10%	-0.11%	-0.07%	-0.09%
Participation rate - 15-69 yrs. (change in pp)	-0.12	-0.12	-0.23	-0.13	-0.17	-0.16	-0.14	-0.19	-0.18	-0.11	-0.12	-0.10	-0.12	-0.16	-0.23	-0.10	-0.15
-low	-0.16	-0.10	-0.22	-0.12	-0.19	-0.17	-0.15	-0.17	-0.20	-0.13	-0.16	-0.12	-0.16	-0.16	-0.22	-0.10	-0.16
-medium	-0.13	-0.15	-0.23	-0.15	-0.18	-0.20	-0.16	-0.21	-0.21	-0.12	-0.14	-0.10	-0.14	-0.18	-0.23	-0.10	-0.16
-high	-0.08	-0.08	-0.14	-0.08	-0.09	-0.10	-0.10	-0.13	-0.12	-0.08	-0.07	-0.07	-0.08	-0.09	-0.14	-0.07	-0.09
Employment (no. of workers)	-0.32%	-0.32%	-0.50%	-0.33%	-0.39%	-0.37%	-0.36%	-0.45%	-0.49%	-0.29%	-0.31%	-0.34%	-0.31%	-0.38%	-0.50%	-0.29%	-0.37%
-low	-0.12%	-0.12%	-0.27%	-0.14%	-0.38%	-0.17%	-0.13%	-0.25%	-0.37%	-0.15%	-0.27%	0.29%	-0.17%	-0.28%	-0.38%	0.29%	-0.18%
-medium	-0.34%	-0.25%	-0.58%	-0.31%	-0.35%	-0.35%	-0.34%	-0.41%	-0.46%	-0.22%	-0.25%	-0.31%	-0.29%	-0.34%	-0.58%	-0.22%	-0.34%
-high	-0.43%	-0.55%	-0.83%	-0.57%	-0.51%	-0.54%	-0.55%	-0.72%	-0.70%	-0.43%	-0.45%	-0.87%	-0.42%	-0.57%	-0.87%	-0.42%	-0.58%
Unemployment rate (change in pp)	0.14	0.12	0.11	0.12	0.10	0.13	0.12	0.15	0.20	0.12	0.12	0.19	0.13	0.11	0.10	0.20	0.13
-low	0.18	0.11	0.12	0.13	0.11	0.13	0.14	0.15	0.21	0.12	0.14	0.23	0.16	0.09	0.09	0.23	0.14
-medium	0.13	0.12	0.10	0.12	0.11	0.13	0.12	0.16	0.21	0.13	0.12	0.19	0.13	0.11	0.10	0.21	0.14
-high	0.13	0.09	0.07	0.08	0.06	0.11	0.08	0.11	0.14	0.09	0.07	0.13	0.11	0.08	0.06	0.14	0.10
new persons - low	0.31%	0.19%	0.27%	0.21%	0.11%	0.24%	0.31%	0.26%	0.19%	0.19%	0.14%	0.71%	0.24%	0.22%	0.11%	0.71%	0.26%
new persons - medium	-0.03%	0.10%	-0.11%	0.05%	0.08%	0.07%	0.03%	0.05%	0.10%	0.10%	0.09%	0.03%	0.03%	0.05%	-0.11%	0.10%	0.05%
new persons - high	-0.18%	-0.34%	-0.53%	-0.36%	-0.32%	-0.27%	-0.31%	-0.41%	-0.37%	-0.22%	-0.28%	-0.62%	-0.19%	-0.35%	-0.62%	-0.18%	-0.34%
Revenue Share	38.05%	57.47%	54.42%	59.19%	67.07%	57.59%	59.13%	59.00%	56.37%	60.07%	55.25%	47.80%	57.75%	70.15%	38.05%	70.15%	57.09%

4.2.5. Dynamic Results

In this subsection, we discuss the dynamic results of the reform. The general economic impact will not change such that in general the reason for different long-run effects will also correspond to the reasons why dynamic results in the modelled countries differ. Therefore these differences will not be discussed again. Instead, we discuss differences in the short-, medium- and long-run as long as important distinctions arise.

Figure 12 provides the dynamic impact of the reform on GDP. It is obvious that the short-run impact on the economy is significantly lower than the medium- (5 to 10 years) and long-run effect. For most countries the immediate impact ranges between 0.2 and 0.3 percent lower growth in the year after the reform.[37] The order of the impact between short- and long-run does not change significantly for the majority of countries. However, there are four countries with either a comparably high short-run effect and a moderate long-run impact or vice versa. In Sweden and Belgium, the immediate GDP effect of the reform is high but it is modest in the long-run. In Spain and the Netherlands, the opposite occurs. The strong short-run impact in Sweden can be dedicated to the way GDP is derived. As GDP is the sum of labour compensation, profits and production taxes (mainly consumption taxes) and consumption taxes are rather high in Sweden the immediate impact on consumption, which decreases strongly, implies the strong GDP effect. Considering production output only, the immediate effect in Sweden is comparably lower.

Figure 12: Dynamic Impact on GDP, Income Tax Reform

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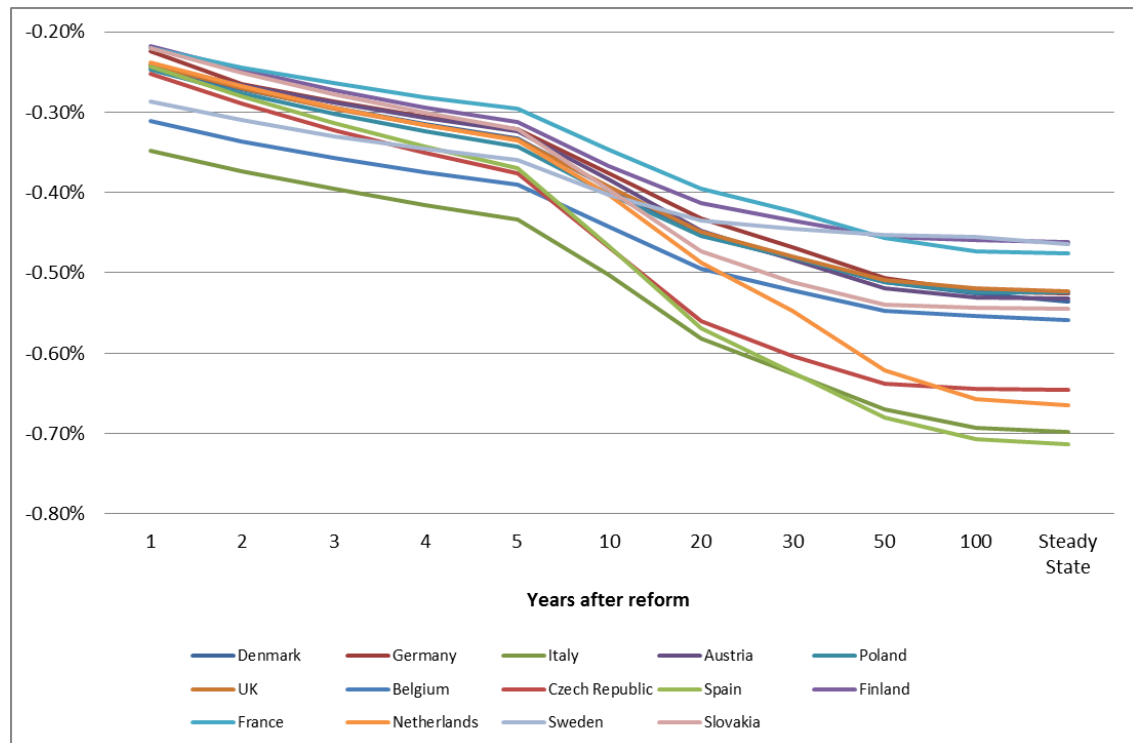
[37] We assume that the reform is announced at the end of year 0 and comes into force at the beginning of year 1.

The dynamic effect of the income tax reform on employment is shown in Figure 13. In general, the dynamic development over time is rather parallel for the countries. The impact in the Netherlands is noticeable. The immediate impact of the reform is rather modest but the effect gets more pronounced over time. This pattern can be attributed to the educational choice of young persons. The reform exerts a comparably strong influence on the educational decision towards less educational effort in the Netherlands. Taking into account that lower skill-groups have a lower employment rate (less participation and higher unemployment), the employment effect gets stronger over time. The strongest effects will arise in Italy and Spain in the short-run as well as in the long-run. The higher impact in Italy can to a large extent be dedicated to an increase of early retirement as labour market participation becomes less attractive compared to pension benefits. In Spain wage bargaining between employers and employees leads to a comparable higher increase of labour costs in the initial periods than in other countries such that labour demand shrinks by more than in other countries. At the same time, net wages decline by more than in most other countries which dampens labour supply more heavily.[38] The same holds true for the Czech Republic. However, especially the skill-shift towards low-skilled persons explains the outcome in Spain and Italy in the long-run, the same argument holds as in the Netherlands.

Figure 13: Dynamic Impact on Employment, Income Tax Reform

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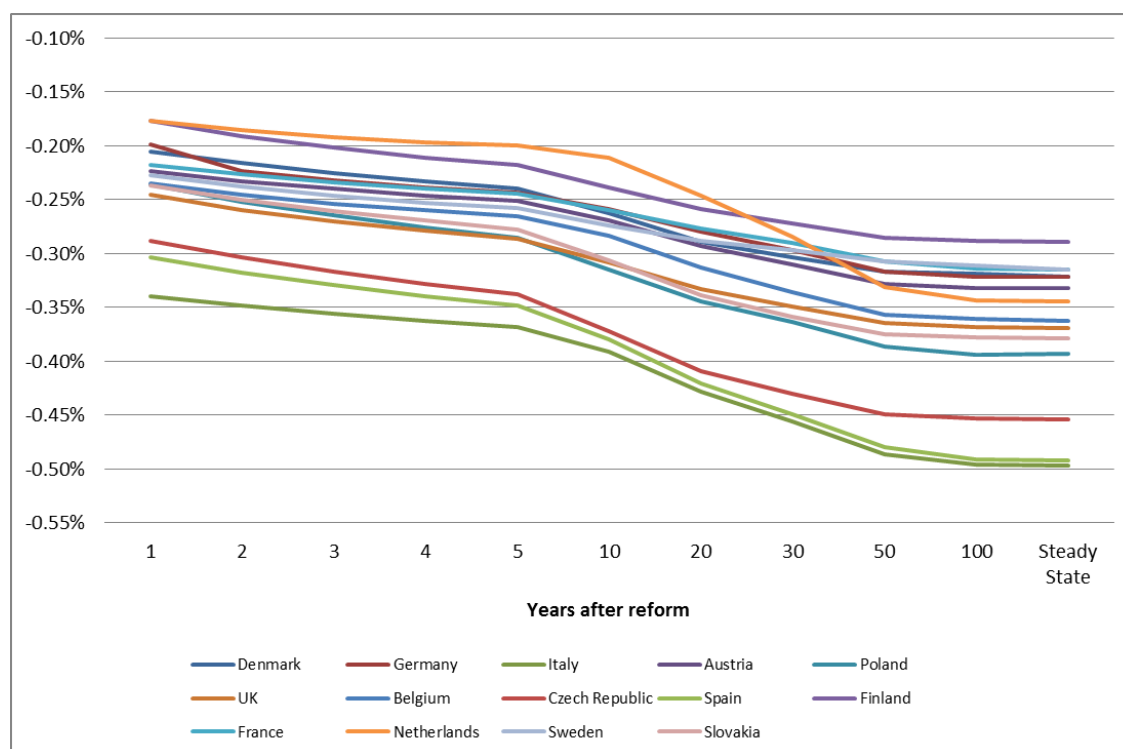
[38] This is a consequence of the rather low compensation of employees in percent of GDP ('labour share'). This implies that the tax reform, which is the same in percent of GDP in all countries, is higher in Spain than in other countries measured in percent of compensation of employees, leading to a stronger impact on wages.

The dynamic unemployment results are shown in Figure 14. Unemployment rises in all countries in the short-run as well as in the long-run. The impact is higher in the long-run as investment declines and a shift towards low-skilled individuals happens in all countries. As unemployment rates of low-skilled persons are higher than for the other skill-groups, the overall unemployment rate rises. In nearly all countries, the dynamic runs rather parallel. As the skill-shift is comparably weaker in Sweden, the impact on unemployment over time weakens as well. The contrary result can be found for the Netherlands and Spain.

Figure 14: Dynamic Impact on Unemployment, Income Tax Reform
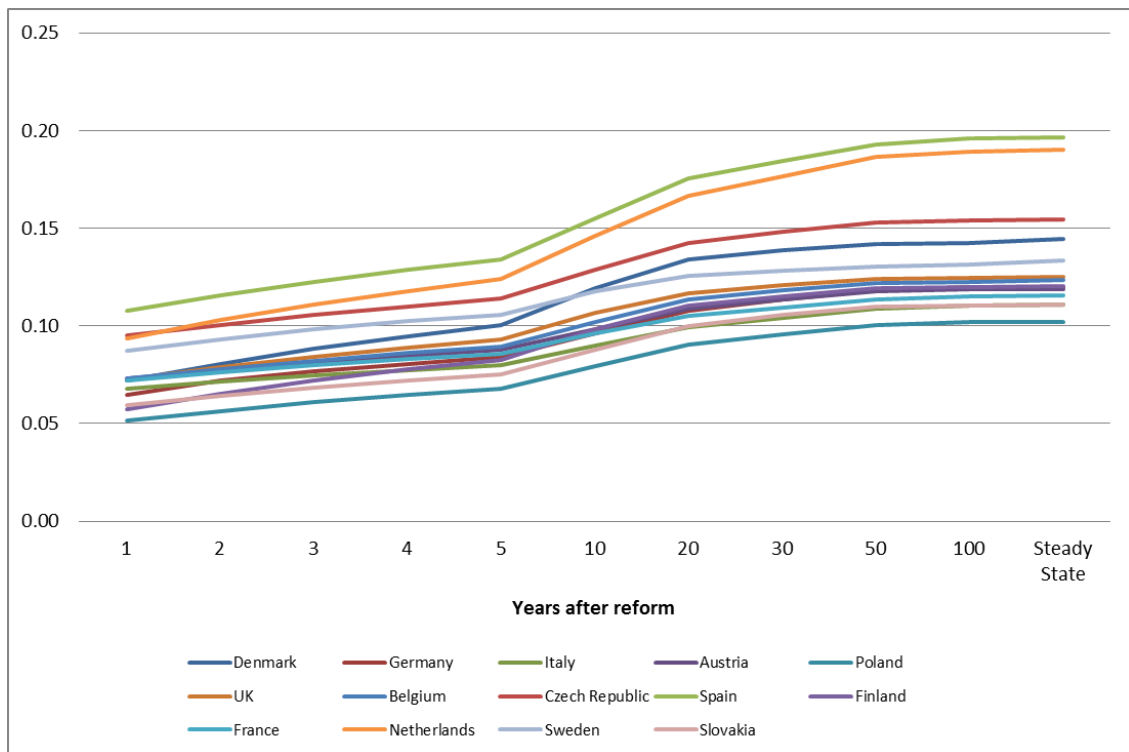
As discussed in the static part of this reform, chapter 4.2.4, the impact on GDP is to a large extent related to the impact of the tax reform on investment. The dynamic effects of the income tax rate reform on investment are shown in Figure 15. One can see that the immediate impact on investment is higher than in the long-run in all countries, even in those countries where the skill-shift towards low-skilled persons is rather high, like in the Netherlands or Spain. The comparably strong impact on investment in Germany at the beginning of the reform is interesting. The reason for this effect is the rather low depreciation rate. A lower depreciation rate implies ceteris paribus that the investment capital ratio is lower. The same adjustment of the capital stock in two countries therefore implies a stronger adjustment of investment in the country with the lower depreciation rate.

Figure 15: Dynamic Impact on Investment, Income Tax Reform
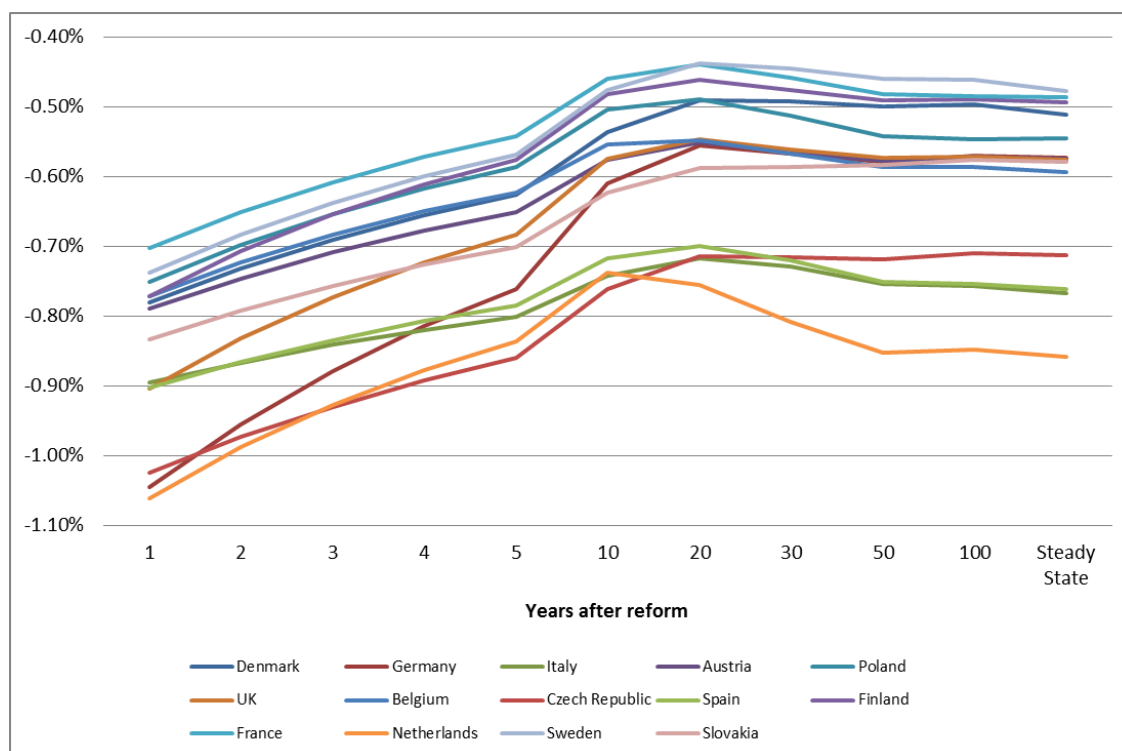
The revenue share, i.e. additional government revenues compared to the assumed ceteris paribus amount of the reform (0.5 percent to GDP), is influenced by several decisions of households and firms. It depends, to a large extent, on the initial ratio of taxes and social security contributions on GDP. This is already discussed in the static part of this subsection. The dynamic is even more complex as the dynamic transition in the countries varies as well. A general feature, as shown in Table 16, in all countries is that the revenue share is the highest in the first years and decreases afterwards. In the medium term, the reform and its implied decline of the capital stock lead to lower wages and less employment such that the revenue share goes down. In the long-run, educational decisions yield a further decline of the revenue share. The different pattern of the decrease from the first to the second period in Germany results from the way how public pension benefits are adjusted. This adjustment depends on the development of the average wage in the economy of the previous year. As the reform leads to higher wages in period 1, this implies higher pension benefits in period 2. In the first period, pension benefits are adjusted according to the development of average wages before the reform (period 0).

In several countries, the revenue share is lowest around 20 years after the reform and increases afterwards. The reason for this is that pension benefits are earnings-related in most countries. As aggregate labour income decreases, aggregate pension payments decline over time such that the revenue share increases again in some of the countries. Of

course, the importance of this effect depends on the extent to which pension benefits are earnings-related. For example, pension benefits are rather independent of labour income in Denmark and therefore no such rebound occurs. Additionally, as taxes on consumption are very high in Denmark, the further decline of private consumption leads to an additional decline of the revenue share. In the Netherlands, the strong increase of low-skilled persons with a lower tax rate than medium- and high-skilled leads to a gradual decline of the revenue share.

Figure 16: Dynamic Impact on the Revenue Share, Income Tax Reform
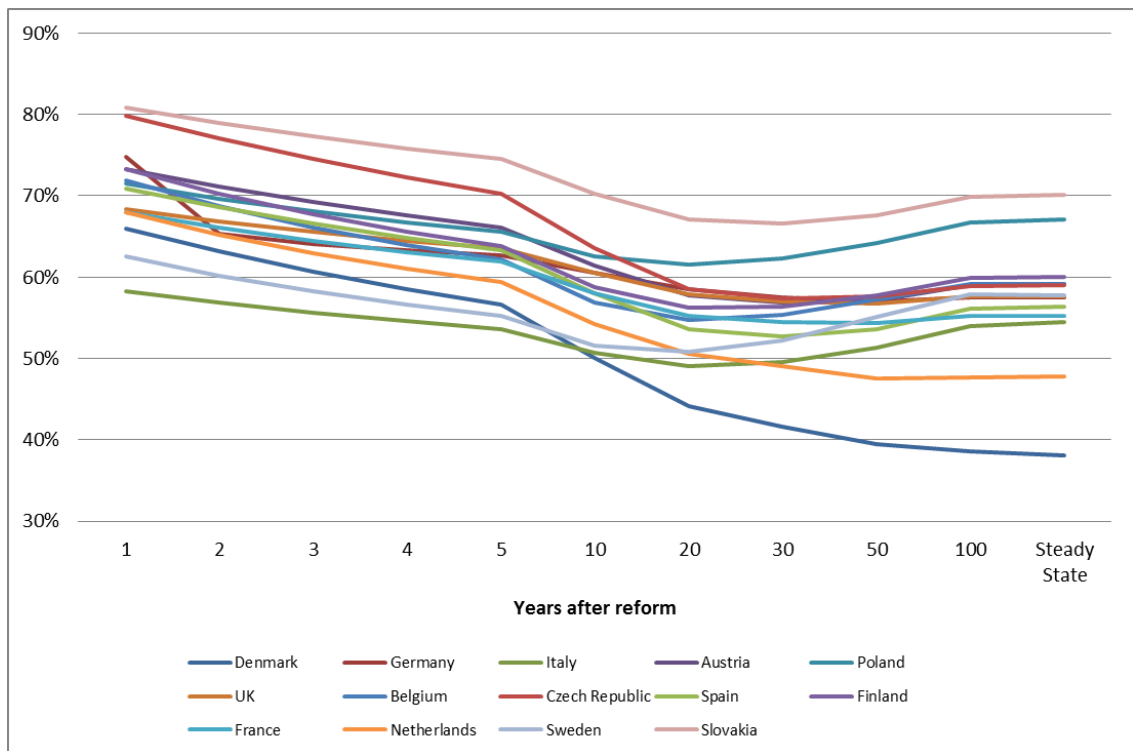
4.3. Social Security

4.3.1. Introduction

Similar to the income tax, social security contributions are an important source to finance social security expenditures in all of the modelled countries. Of all contributions, the major source are contributions to the public pension system. Other relevant contributions are charged for the public health system and the public unemployment system. In most countries, contributions are defined in proportion of labour income of employees[39]. Often, an income threshold is defined such that income above the cap is exempted from social security contributions. For low-income employees, social security contributions are the major source of wage-related costs, whereas the income tax gets more important as labour income increases.

The recent financial and economic crisis led to a sharp increase of unemployment in several European countries. According to Eurostat, the unemployment rate of the EU-27 increased from 7.1 percent in 2008 to 9.7 percent in 2011. However, different groups of persons were affected to a different extent. In particular, the unemployment rate of low-skilled persons rose sharply whereas unemployment of high-skilled persons increased to a much lesser extent. One possible means to influence labour demand as well as labour supply is to decrease social security contributions for persons with low income. Such a policy should increase demand for low-skilled persons and result in higher employment. The flip side of the coin is lower public revenues, which is especially problematic in the current situation. Nevertheless, we perform this simulation to analyse the impact on the economy and to compare the results between the modelled countries.

4.3.2. Policy Scenario

In this policy scenario, we decrease employers' social security contribution rates for low-income workers. One important criterion of the reform is the definition of low-income. We assume that low-income is defined as **labour income below a threshold of 60 percent of the average worker** as defined by the OECD's Taxing Wages (OECD 2010b). The distribution of labour income differs significantly across countries. Given that the costs of the reform for the public budgets are the same, the change of tax rates varies across countries. If labour income is rather evenly distributed, then all the groups in the model may be affected rather similar. If the distribution is rather uneven, the age- and skill-groups will be treated unequally. Contribution rates are reduced in such a way that **total budgetary costs amount to 0.5 percent of GDP ceteris paribus**. This means that the costs are derived by assuming that all the economic agents do not adjust their behaviour as a matter of the tax reform.

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[39] In some countries, gains of self-employed are subject to social security contributions as well.

4.3.3.   General Economic Impact

In general, the economic impact of a change of social security contributions is to some extent very similar to the income tax reform. The reduction decreases the tax wedge between labour costs and net labour income. However, there are also important differences. First, social security contributions are levied on labour income in general, whereas the income tax is levied on a broader definition of income. Second, social security contributions are often capped above an income threshold. Instead, the income tax is in general progressive. Therefore, different types of income groups are affected differently, implying different effects for the age- and skill-groups in the model as well.

The reform decreases employer's social security contributions, generating an additional job rent, meaning that the government share of the value added of a job match decreases. In the wage bargaining process, this additional share is split between employee and employer, such that net income of the employee rises on the one hand and the profit of the employer increases (as labour costs decrease) on the other hand. This has an impact on labour supply as well as on labour demand. Labour supply rises as net labour income rises, labour demand increases given the higher job match rent. Therefore, firms offer additional vacancies to unemployed persons. Labour supply is affected along several margins. First, higher expected labour income leads to additional participation on the labour market. Older workers retire later. Another margin which is affected is the number of hours worked which also increases as marginal wages increase. The third margin affected is the search effort for a new job of unemployed persons. As labour income typically rises by more than unemployment income as a result of the policy reform, replacement income decreases relatively to work income, leading to additional search. Higher labour supply (participation, search effort) and higher labour demand result in an increase of job matches. In addition, the higher job rent for firms leads to a decrease of the lay-off rate of firms. All these effects together raise employment.

With respect to the age groups, one would expect a stronger impact of the reform on employment and unemployment for younger workers. The reason is twofold. First, as income is in general lower for younger workers, the impact of the reform is stronger for this group. Second, the labour market is more flexible for this group, implying a larger reaction.

The reform will also exert a positive influence on the retirement age, meaning that retirement should be postponed. As only social security contributions of employers are adjusted, the tax burden of retirees does not change. Therefore, employment income rises compared to retirement income, implying that workers retire later. However, the effect partly depends on

the design of the pension system. If claims to the public retirement system rise with the additional gross income, the long-run effect is much weaker.[40]

In addition, the reform has an impact on the human capital decision of households and firms. In general, less skilled workers are more affected by the reform than other skill-groups as the share of persons with low income is higher within this group. One should expect a skill-shift towards low- and maybe medium-skilled persons.

The impact on investment is not clear in advance as there are two counteracting effects. On the one hand, a higher level of employment will raise investment and therefore the capital stock to maintain the capital labour ratio in the economy. On the other hand, as employment effects will in general be stronger for low- and partially medium-skilled persons, one could expect that firms decrease the average capital-labour ratio given capital-skill complementarity and lower productivity of lower-skilled individuals. The overall effect is therefore ambiguous.

The impact on private consumption depends on how the public budget is balanced. In this simulation, we assume that unproductive public consumption is decreased in a way that government debt in percent of GDP stays constant. In this case, income of private households increases by the total amount of the reform and is completely financed by the public sector even if there were no positive economic effects of the reform (i.e. we simulate no lump-sum taxes to finance the reform). As a result, private consumption should increase as private household's disposable income as well as the value of their assets rise. Combined with additional revenues induced by the additional economic activity, this will raise tax revenues (VAT, income tax and other labour taxes) implying that the reform is self-financing to some extent.

4.3.4. Comparative Static Results

The country results may differ by more than for the income tax reform as the systems in the countries vary to a larger extent. The unweighted average of the GDP increase across the 14 countries amounts to 0.28 percent in the long-run. The least pronounced effect will happen in Denmark with 0.15 percent, the most pronounced in Poland with 0.39 percent, more than twice as much. The simulations also indicate a strong GDP effect in Italy, the Czech Republic and Slovakia. For most other countries, GDP rises by between 0.2 and 0.3 percent. Employment rises in all countries, on average by nearly 0.4 percent and the results for the individual countries range from 0.28 to 0.55 percent. The increase is strongest for the low-skilled persons with 1.1 percent on average and rather minor for the high-skilled persons with -0.03 percent on average. The negative impact on employment of high-skilled workers is

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[40] In several countries this will happen over time as pension claims are earnings-related. In this case, pension claims of older workers rise only slightly in the first years of the reform. For subsequent generations, claims rise as higher wages are generated for a longer period of employment.

a result of the educational decisions of individuals, leading to less high-skilled labour supply. The level of investment rises by much less and the change of investment is even negative in Denmark. Therefore the capital intensity, i.e. capital stock divided by the number of workers, decreases. The reason for this effect is the increase of the share of low-skilled workers in the economy. The impact on GDP, employment and investment is shown in Figure 17, Figure 18 and Figure 19.

Figure 17: GDP, Social Security Reform
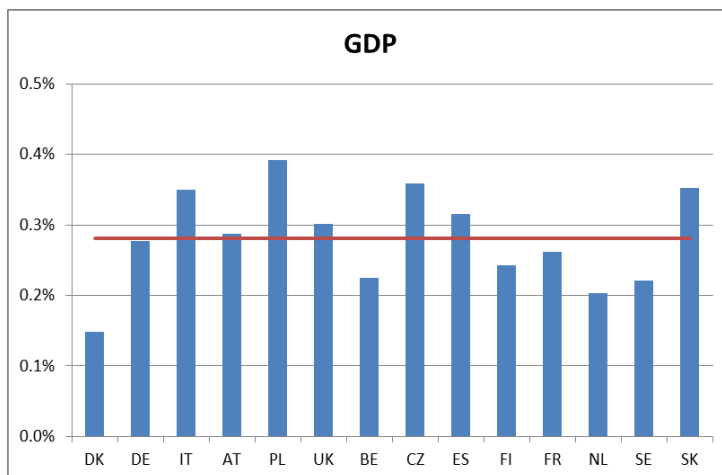
Figure 18: Employment, Social Security Reform
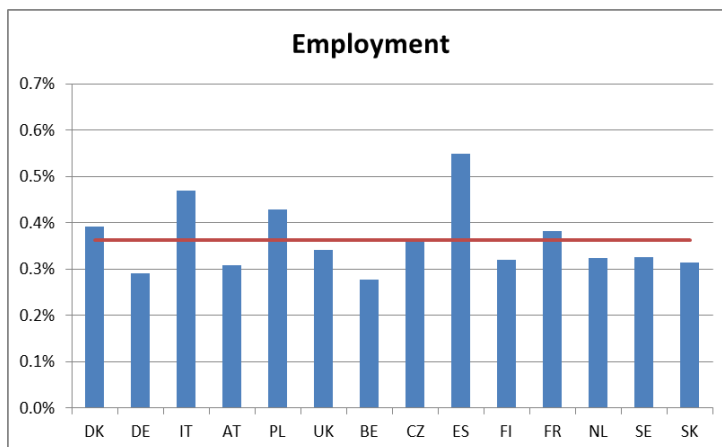
Figure 19: Investment, Social Security Reform
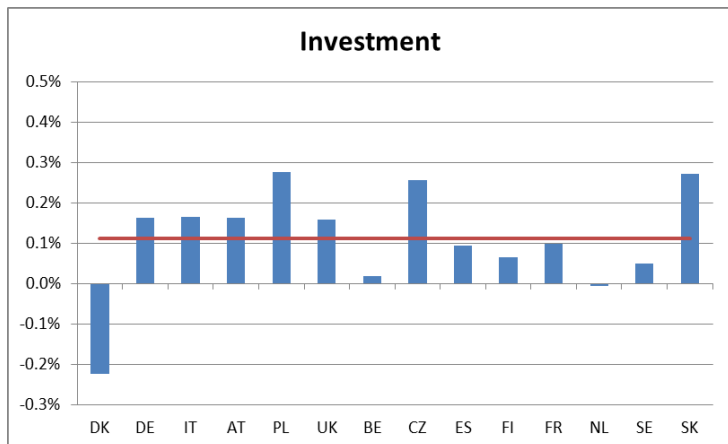
One can compare the effect on employment with the effect on GDP as in Figure 20. The trend line shows that there is a positive relationship between employment and GDP, but the relationship is rather small. In Denmark, for example, there is a rather strong employment effect but only a very small impact on GDP. On the other hand, the model shows rather strong GDP effects but only small employment effects in Slovakia. The strongest employment effect arises in Spain. The reason lies in the very low labour-share on GDP, or, vice versa, the high capital-share. As the reform is 0.5 percent of GDP in all countries, the reform is considerably higher relative to labour costs in Spain.

Figure 20: Employment (in percent) and GDP (in percent), Social Security Reform
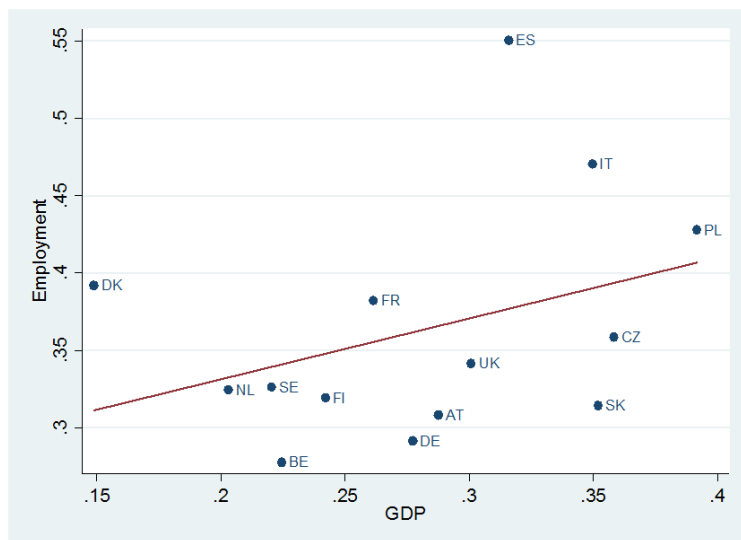
On the other hand, there seems to be a strong relationship between the level of investment and the effect on GDP, as indicated in Figure 21. The trend line shows that the changes of the level of investment and GDP are closely related. The negative impact on investment in Denmark corresponds with a comparably small effect on GDP, whereas the employment

effect is rather strong. However, employment and investment are in general very well linked. Why do these both variables develop in a different way as a result of the reform? The answer is the difference of the impact of the reform on the three skill-groups and the educational decisions. In countries with a higher GDP effect, the effect on low-skilled employment is also higher. However, it is important that high employment is not a matter of a strong shift of the educational level towards the low-skilled, which is the case in Denmark. A large part of the reform concentrates on low-skilled persons. Combined with a rather low skill-premium, this implies that the reform leads to a stronger skill-shift towards low-skilled in Denmark. The fact that low-skilled persons are less productive on average and that they have lower employment rates explains the rather small effect on investment and GDP in Denmark. The argument of the low skill-premium and the implied impact on skill choice towards low-skilled individuals also holds for the Netherlands and Sweden.

Figure 21: Investment (in percent) and GDP (in percent), Social Security Reform
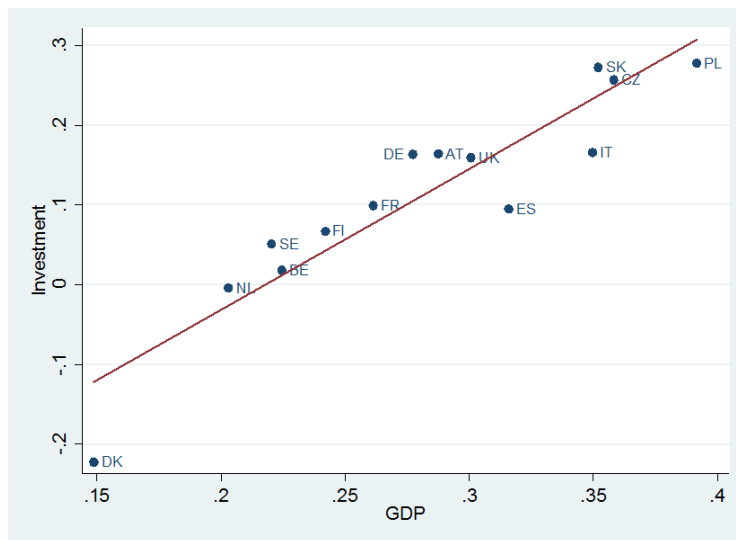
In general, higher employment decreases unemployment. However, the relationship is not one-by-one as higher labour supply (such as the participation decision) counteracts the higher labour demand of firms concerning the reduction of the unemployment rate. Unemployment decreases by between 0.1 percentage points and 0.3 percentage points and by an unweighted average of 0.15 percentage points. In all countries, unemployment of younger and low-skilled workers decreases by more than that of other groups of workers. On the one side, unemployment falls significantly in Denmark and Spain and by more than in other countries. On the other side, unemployment is less affected in Slovakia. This result is presented in Figure 22. In the first two countries, the unemployment rate of medium-skilled persons is affected significantly as well whereas unemployed medium-skilled persons benefit less in Slovakia than in other countries. This leads to the rather low impact on unemployment. The correlation between employment and unemployment in the different

countries is shown in Figure 23 and it seems to be rather weak. In Demark, the stronger unemployment effect compared to the employment effect is obvious.

Figure 22: Unemployment Rate (in pp), Social Security Reform
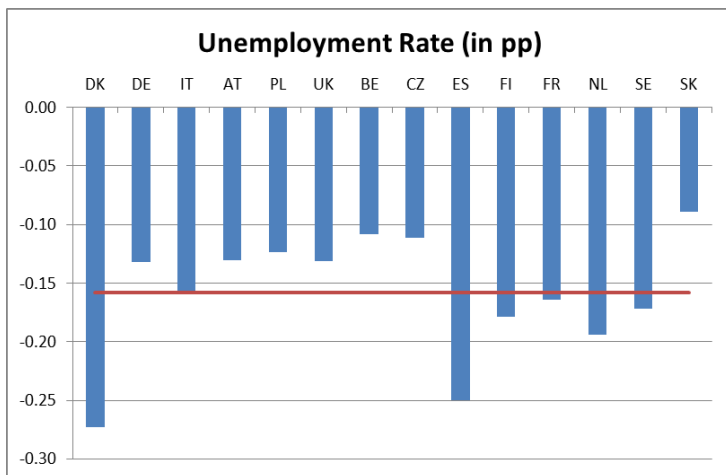
Figure 23: Employment (in percent) and Unemployment (in pp), Social Security Reform
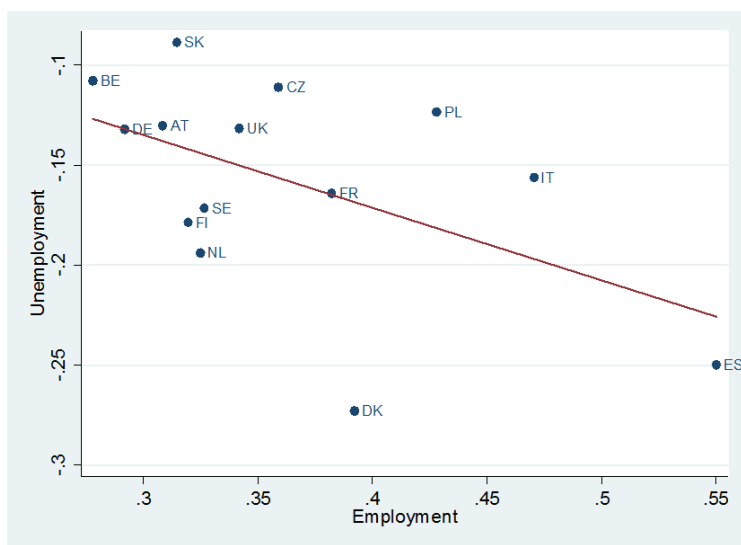
The decrease of the employer's social security contributions implies higher disposable income of private households because of higher gross wages, which leads to a significant increase of private consumption. The impact on private consumption across the modelled countries is smoother than the differences in the economic activity or employment would suggest. The increase of disposable income consists of two sources. The first source, the direct effect, corresponds to the decrease of social security contributions amounting to 0.5 percent of GDP. This value is the same in all the countries. The second source, the induced effect, consists of income generated by the additional economic activity. This type of additional income differs between the countries. However, adding both sources leads to a

smoother change of the consumption profile than for other variables. The level of consumption in the different countries is presented in Figure 24.

Figure 24: Private Consumption, Social Security Reform
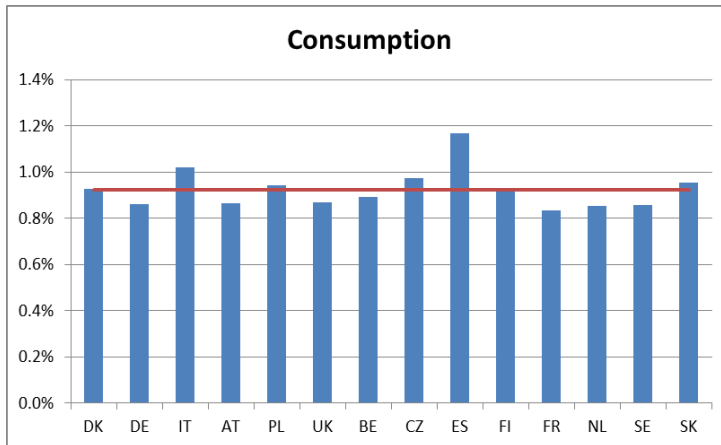
Figure 25 shows the degree of self-financing of the reform in the various countries. The results differ significantly and range from 36 percent in Slovakia to 65 percent in Denmark. This wide range does not necessarily correlate with the impact on employment or GDP. For most of the countries, the degree of self-financing lies between 45 percent and 55 percent. Similar to the income tax reform, the variation of the degree of self-financing depends, to a large extent, on the public revenue share in the economies. Figure 26 shows the correlation between the degrees of self-financing of the reform and the share of taxes and social security contributions on gross value added. One can easily detect a very high correlation between these two variables. An especially high degree of self-financing can be found in Denmark. High degrees are also derived for Belgium, France, the Netherlands and Sweden. Similar to the income tax reform, the degree to which pensions are earnings-related also determines the degree of self-financing.

Figure 25: Degree of Self-Financing, Social Security Reform
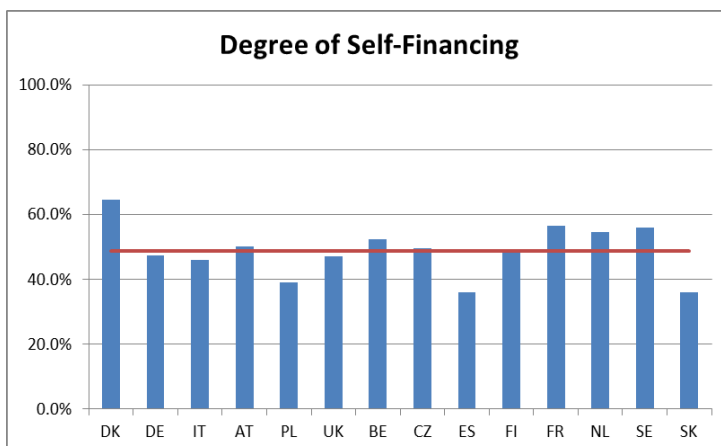
Figure 26: Tax Ratio and Degree of Self-Financing, Social Security Reform
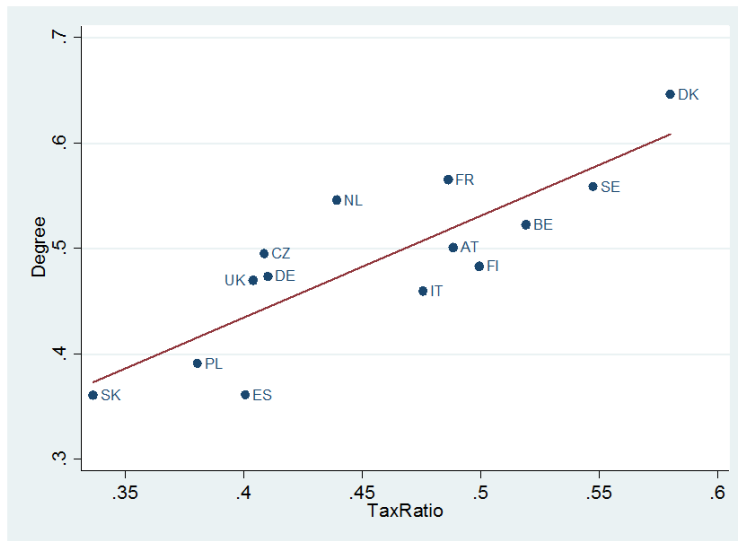
The model results show that the analysed decrease of the social security contributions leads to a positive impact on the economy in all countries. However, the outcomes differ between the countries. The result is determined by the level of investment and labour supply of the different age- and skill-groups. The simulation gives the insight that labour supply is affected on several diverse margins, which leads to noticeable differences of the impact of the reform. This is a result of the different distribution of the reform on the age- and skill-groups as well as institutional details in the countries. In particular, employment of low-skilled and younger persons rises in all countries, implying positive distributional effects. However, this positive impact has the drawback of less investment in education, leading to a higher share of low-skilled persons in the economy. In addition, the reform leads to higher consumption of private households. The reform implies a large range of the degree of self-financing which is largely determined by the initial tax share in the economy.

Table 31: Steady State Results of the Social Security Reform

Social Security Reform	DK	DE	IT	AT	PL	UK	BE	CZ	ES	FI	FR	NL	SE	SK	min	max	Avg
GDP	0.15%	0.28%	0.35%	0.29%	0.39%	0.30%	0.22%	0.36%	0.32%	0.24%	0.26%	0.20%	0.22%	0.35%	0.15%	0.39%	0.28%
Capital Stock	-0.22%	0.16%	0.17%	0.16%	0.28%	0.16%	0.02%	0.26%	0.09%	0.07%	0.10%	0.00%	0.05%	0.27%	-0.22%	0.28%	0.11%
Consumption	0.93%	0.86%	1.02%	0.86%	0.94%	0.87%	0.89%	0.97%	1.17%	0.92%	0.83%	0.85%	0.86%	0.96%	0.83%	1.17%	0.92%
Trade Balance (change in % of GDP)	-0.04%	0.01%	0.03%	0.01%	0.06%	0.01%	0.04%	0.05%	0.02%	0.04%	-0.01%	-0.01%	0.04%	0.05%	-0.04%	0.06%	0.02%
Gross wage rate (Labour costs per hour)	-0.32%	-0.19%	-0.25%	-0.18%	-0.18%	-0.16%	-0.19%	-0.17%	-0.34%	-0.20%	-0.26%	-0.25%	-0.23%	-0.14%	-0.34%	-0.14%	-0.22%
-low	-1.97%	-0.71%	-0.77%	-0.81%	-0.85%	-0.57%	-0.77%	-1.24%	-0.93%	-0.88%	-0.79%	-0.90%	-1.05%	-0.75%	-1.97%	-0.57%	-0.93%
-medium	-0.18%	-0.35%	-0.08%	-0.23%	-0.38%	-0.36%	-0.39%	-0.31%	-0.37%	-0.53%	-0.45%	-0.43%	-0.31%	-0.28%	-0.53%	-0.08%	-0.33%
-high	0.62%	0.28%	0.52%	0.38%	0.33%	0.31%	0.37%	0.59%	0.48%	0.38%	0.36%	0.40%	0.30%	0.46%	0.28%	0.62%	0.41%
Net wage rate	0.77%	0.71%	0.69%	0.78%	0.71%	0.71%	0.71%	0.95%	0.84%	0.75%	0.74%	0.71%	0.69%	0.87%	0.69%	0.95%	0.76%
-low	0.74%	1.25%	0.89%	1.49%	1.47%	1.10%	0.96%	2.33%	1.12%	0.98%	1.21%	0.92%	0.56%	1.60%	0.56%	2.33%	1.19%
-medium	0.84%	0.74%	0.67%	0.75%	0.85%	0.70%	0.67%	0.98%	0.79%	0.82%	0.76%	0.76%	0.75%	0.91%	0.67%	0.98%	0.79%
-high	0.96%	0.63%	0.75%	0.66%	0.55%	0.64%	0.71%	0.75%	0.83%	0.73%	0.63%	0.75%	0.77%	0.74%	0.55%	0.96%	0.72%
Average number of hours worked per worker	0.04%	0.07%	0.10%	0.07%	0.08%	0.06%	0.07%	0.08%	0.11%	0.07%	0.07%	0.08%	0.05%	0.08%	0.04%	0.11%	0.07%
Participation rate - 15-69 yrs. (change in pp)	0.07	0.09	0.18	0.11	0.17	0.13	0.10	0.16	0.18	0.08	0.13	0.08	0.10	0.14	0.07	0.18	0.12
-low	0.11	0.17	0.27	0.24	0.39	0.22	0.18	0.41	0.26	0.15	0.25	0.14	0.16	0.27	0.11	0.41	0.23
-medium	0.10	0.10	0.13	0.09	0.17	0.14	0.09	0.15	0.14	0.09	0.10	0.08	0.11	0.14	0.08	0.17	0.12
-high	0.06	0.05	0.09	0.05	0.06	0.06	0.06	0.08	0.07	0.05	0.05	0.04	0.06	0.06	0.04	0.09	0.06
Employment (no. of workers)	0.39%	0.29%	0.47%	0.31%	0.43%	0.34%	0.28%	0.36%	0.55%	0.32%	0.38%	0.32%	0.33%	0.31%	0.28%	0.55%	0.36%
-low	2.56%	0.76%	1.01%	0.91%	1.06%	0.75%	0.90%	1.28%	1.08%	1.07%	0.86%	1.05%	1.35%	0.78%	0.75%	2.56%	1.10%
-medium	-0.08%	0.31%	0.18%	0.24%	0.43%	0.35%	0.26%	0.35%	0.31%	0.36%	0.36%	0.25%	0.23%	0.33%	-0.08%	0.43%	0.28%
-high	-0.42%	0.06%	-0.11%	0.03%	0.18%	0.04%	-0.12%	0.10%	-0.07%	-0.05%	-0.01%	-0.14%	-0.07%	0.14%	-0.42%	0.18%	-0.03%
Unemployment rate (change in pp)	-0.27	-0.13	-0.16	-0.13	-0.12	-0.13	-0.11	-0.11	-0.25	-0.18	-0.16	-0.19	-0.17	-0.09	-0.27	-0.09	-0.16
-low	-0.38	-0.33	-0.23	-0.30	-0.24	-0.22	-0.21	-0.33	-0.36	-0.34	-0.30	-0.29	-0.30	-0.18	-0.38	-0.18	-0.29
-medium	-0.31	-0.12	-0.12	-0.11	-0.14	-0.12	-0.11	-0.11	-0.24	-0.20	-0.16	-0.20	-0.18	-0.09	-0.31	-0.09	-0.16
-high	-0.21	-0.08	-0.09	-0.07	-0.06	-0.09	-0.07	-0.07	-0.12	-0.10	-0.07	-0.13	-0.12	-0.07	-0.21	-0.06	-0.10
new persons - low	1.98%	0.05%	0.25%	0.17%	0.02%	0.16%	0.32%	0.11%	0.26%	0.44%	0.11%	0.52%	0.77%	-0.10%	-0.10%	1.98%	0.36%
new persons - medium	-0.53%	0.03%	-0.16%	-0.01%	-0.01%	0.03%	0.00%	0.01%	-0.15%	0.01%	0.03%	-0.07%	-0.12%	0.02%	-0.53%	0.03%	-0.07%
new persons - high	-0.72%	-0.09%	-0.35%	-0.12%	0.02%	-0.15%	-0.29%	-0.09%	-0.30%	-0.22%	-0.16%	-0.34%	-0.28%	-0.03%	-0.72%	0.02%	-0.22%
Degree of Self-Financing	64.64%	47.35%	45.95%	50.11%	39.08%	46.99%	52.26%	49.49%	36.10%	48.31%	56.54%	54.61%	55.88%	36.07%	36.07%	64.64%	48.81%

4.3.5. Dynamic Results

In this subsection, we discuss the dynamic impact of the change of social security contributions.

Figure 27: Dynamic Impact on GDP, Social Security Reform
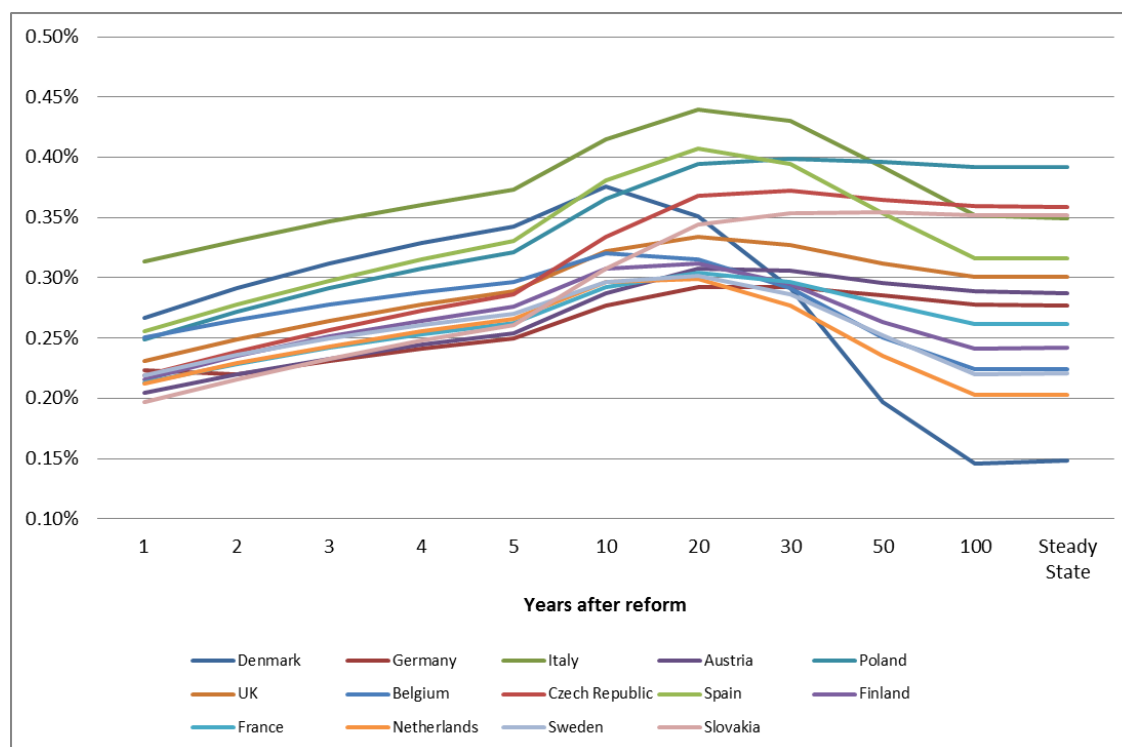
The dynamic impact of the social security reform on GDP is shown in Figure 27 and can be characterized as an immediate growth effect of about 0.2 to 0.3 percent and a further increase to 0.3 to 0.45 percent 20 years after the reform. It is mainly induced by the capital stock adjustment as a result of the additional investment. In the following years the skill-shift towards low-skilled persons dampens the positive growth effect in most of the countries. The latter effect is especially strong in Denmark, Belgium, Italy, the Netherlands, Spain and Sweden. In these countries, the share of high-skilled persons diminishes more pronouncedly than in other countries. In general, the simulated decrease of social security contributions favours low- and medium-skilled persons, which induces less educational effort.

In contrast to the GDP results, the dynamic employment effect is rather stable in most countries. Given that the decrease of social security contributions leads to wage moderation, firms increase labour demand rather quickly. The impact on employment is dampened after 10 to 20 years after the reform in some of the countries as a result of the changes of the educational structure with a higher share of low- and medium skilled persons. As the

employment rate of these groups is lower, employment diminishes again. This pattern is very similar to the dynamic GDP results.

Figure 28: Dynamic Impact on Employment, Social Security Reform
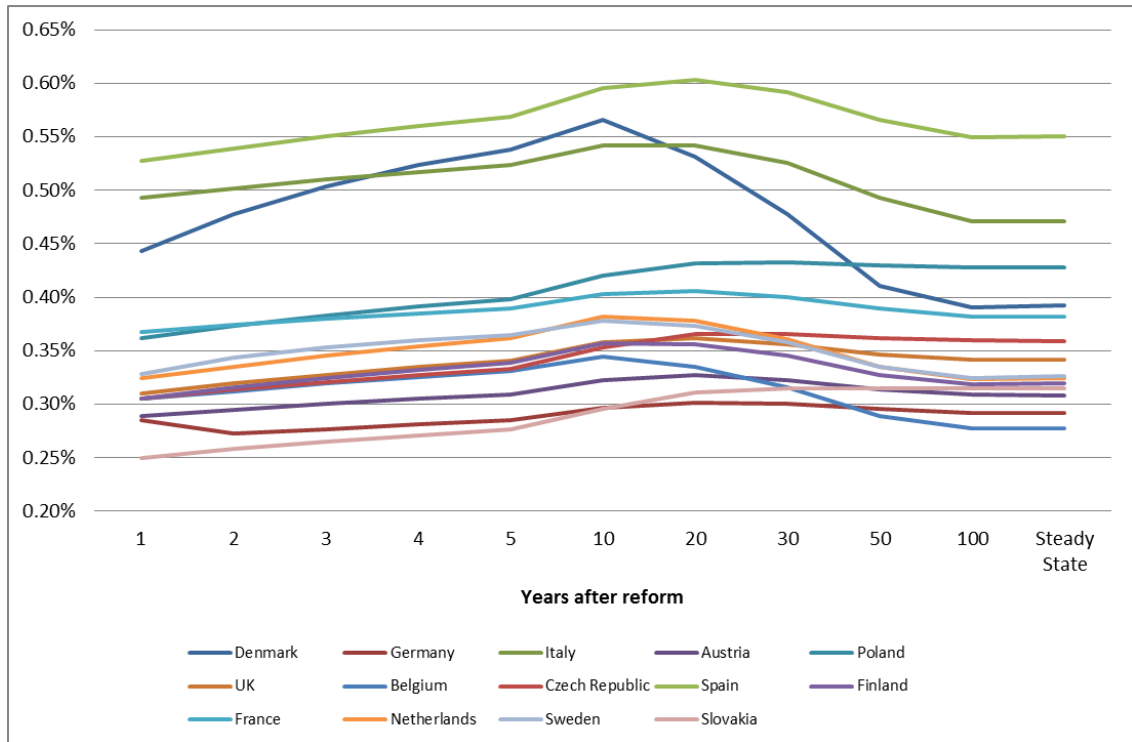
Unemployment will not change markedly over the whole horizon after the immediate adjustment in all the countries. This is mainly a result of the very low employment variations over time. The big differences in the change of the unemployment rate between the countries are to some extent the result of different employment effects (see the analysis in the static part). The employment effect and unemployment effect is influenced by several important characteristics of the economy. In Denmark and Spain, the high capital share explains the comparably higher employment and unemployment effect. The stronger reduction of unemployment in the Netherlands is to some extent the result of a more moderate increase of the participation rate. For given labour demand, this implies that unemployment decreases by more.

Figure 29: Dynamic Impact on Unemployment, Social Security Reform
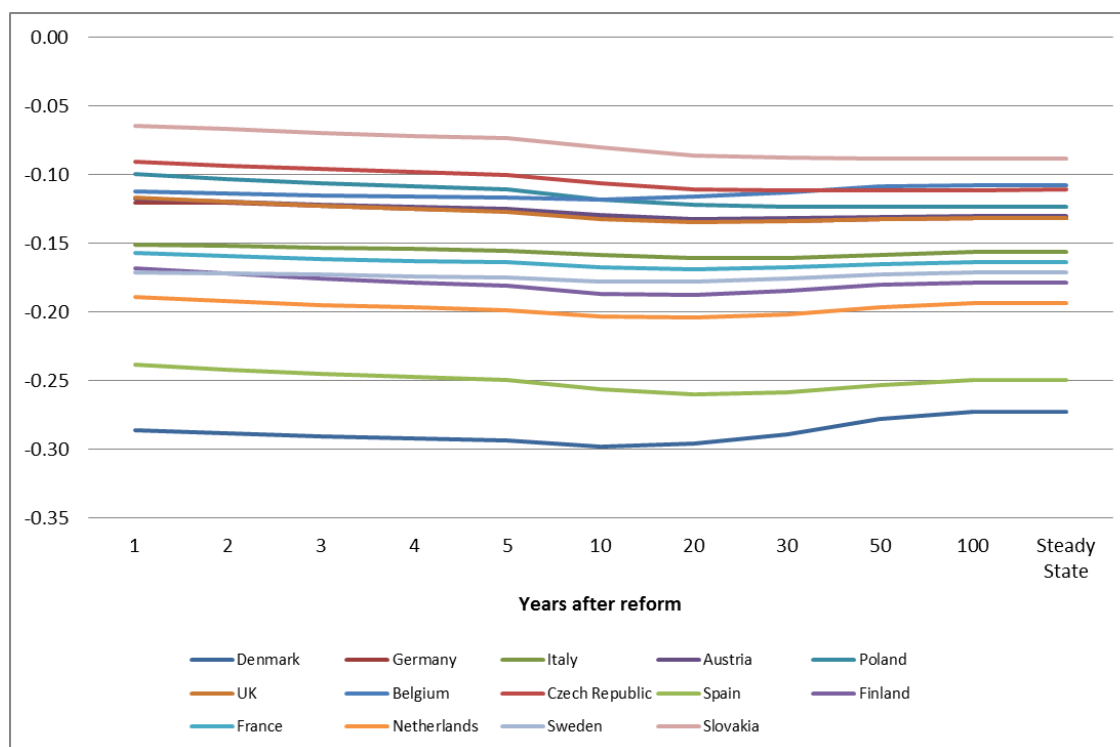
Investment plays an important role for the GDP effect in this reform. The dynamic of this variable is displayed in Figure 30. Similar to the Income Tax reform, the investment change is the highest in the first periods in order to adjust the capital stock, but declines in the following years. This pattern arises in all countries. In the medium- and long-term the level of investment is also influenced by the skill-shift towards low-skilled as the reform aims to improve the labour market situation of low-income persons. This is a result of capital-skill complementarity in the production. As already mentioned several times before, this is especially pronounced in Denmark. In the first five to ten years this effect is not relevant for the labour force composition. In this period, the investment impact in Denmark is very similar to all other countries. In the following years, investment in Denmark even declines to a lowerlevel than before the reform as the low-skilled share rises heavily compared to the other countries. The large decline of investment over time and the skill shift also explain the dynamic GDP effect in Figure 27.

The degree of self-financing (meaning by how much of the ceteris paribus costs of the reform will be financed by higher revenues and lower expenditures due to the higher economic growth) is very high initially and lies between a little bit less than 50 percent and 75 percent. This share varies significantly between the countries but depends largely on the tax ratio in the countries. Due to the increase of the capital stock, this share increases further in the following periods as shown in Figure 31. Afterwards, the degree of self-financing

decreases due to two reasons. First, additional expenditures for pension claims lead to a rather strong decline of the degree of self-financing. The reform leads to a decline of labour costs for firms as employers' social security contributions are reduced but nevertheless gross wages increase, thus leading to a higher assessment base for the pension system. This ameliorates public finances for several years but leads to additional expenditures in the future. The extent depends on the degree to which pension benefits are earnings-related. Second, the skill-shift towards lower skills dampens the economic effect over time, which also reduces the degree of self-financing. In Denmark for example the pension effect explains only a minor part of the sharp reduction of the degree of self-financing (pension benefits in Denmark depend only to a minor extent on previous labour income). In contrast to the other countries, this sharp decline is the result of the comparably strong increase of the share of low-skilled in the economy. Again, the impact of the pension system in Germany in the first period is striking.

Figure 30: Dynamic Impact on Investment, Social Security Reform
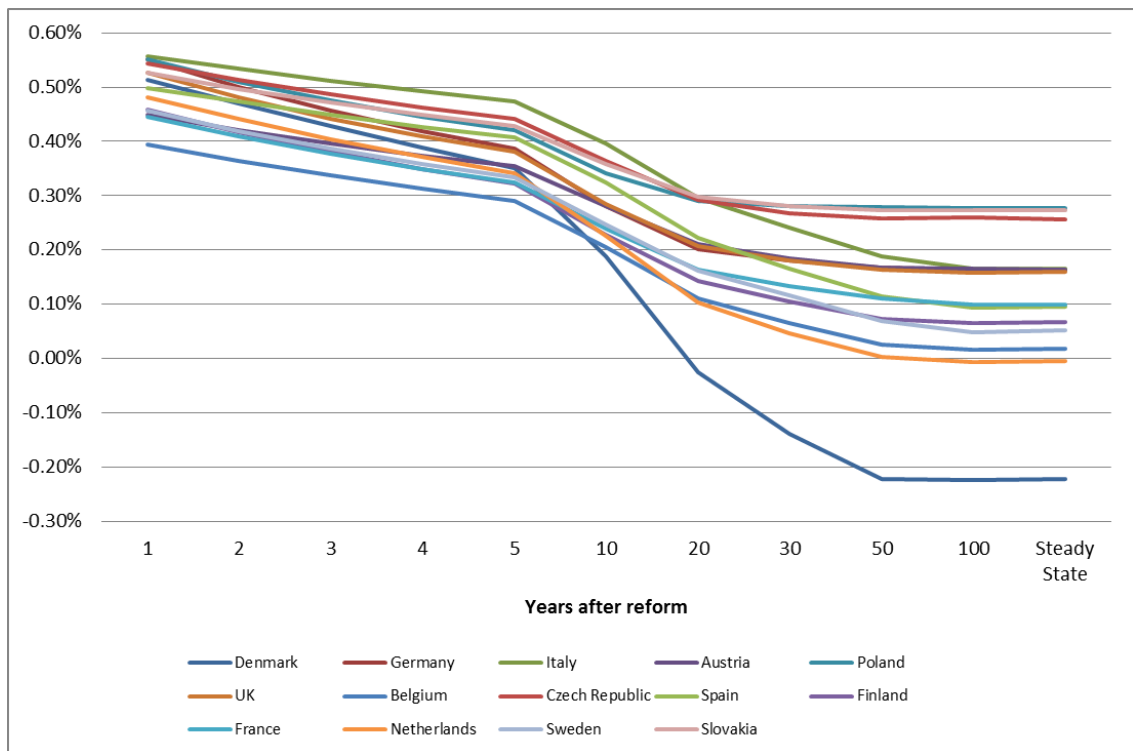
Figure 31: Dynamic Impact on Self-Financing, Social Security Reform
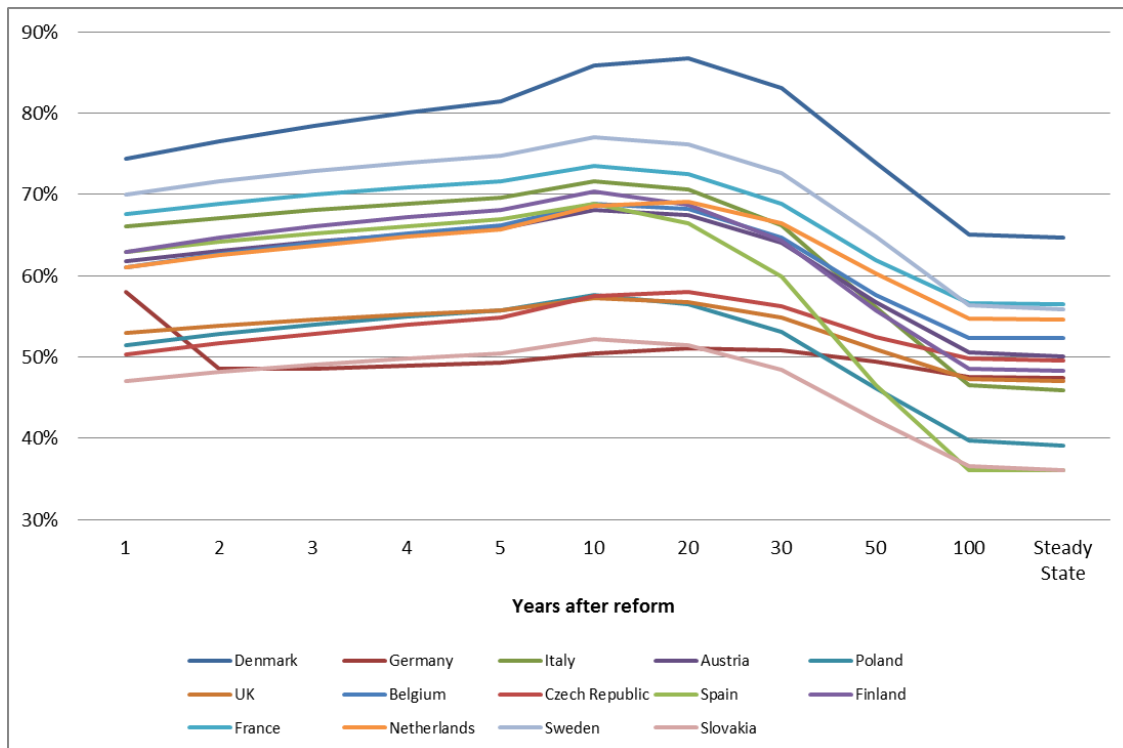
4.4. Training Subsidy

4.4.1.   Introduction

Policy makers and scientific advisors have increasingly stressed the importance of human capital for a vital economy and society. For instance, the European Commission (2007) assigns a key role to education and training in responding to some of the main medium- and long-run challenges that European economies are facing (such as globalisation, an ageing population, technological progress and skill shortages). In addition, the increase of unemployment as a consequence of the economic crisis implies that many workers will lose part of their (firm-specific) human capital. Thus, it seems to be even more important that firms and workers invest in life-long learning.

Figure 32: Investment by Enterprises in Training of Adults, Direct and Labour Costs of Participants Divided by Total Labour Costs, 2005
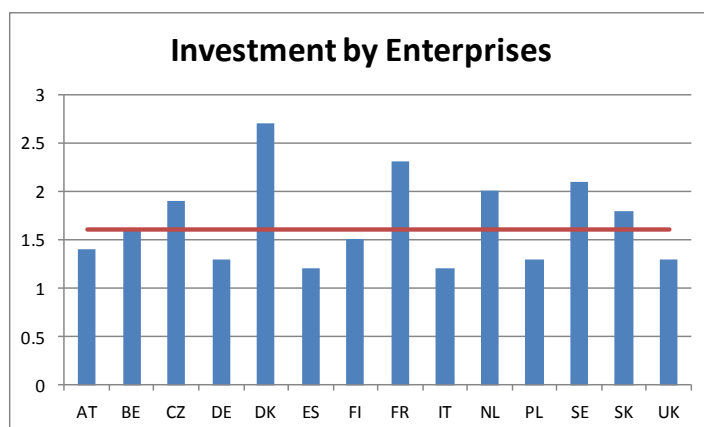
Red line: EU-15-average
Source: Indicators of Lime Assessment Framework.

In his seminal work, Becker (1962) distinguishes two different forms of training and human capital: whereas *general* human capital is applicable in all firms, *specific* human capital is only available in a particular one. According to his paper, employers will pay the full costs of specific training whereas the costs of general training are borne by employees.[41] However, if confronted with empirics, this prediction is questionable since many authors find that firms finance part of the costs for training which can be characterised as general. This can be explained, for example, if the marginal product is higher than the wage due to labour market inefficiencies. In that case, firms can extract part of the profits from training employees. In line with this argument, employers seem to finance around three quarters of entire training costs in an average OECD country (see Bassanini et al. (2005)).[42] Figure 32 illustrates

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[41] See European Commission (2007), for example, for a review of the literature.
[42] Furthermore, there is also little evidence that employees indirectly pay via lower wages.

investment of training by enterprises in the 14 countries modelled in the LMM (calculated as the direct costs plus the labour costs of participants divided by total labour costs). On average of the EU-15, firms pay 1.6 percent of total labour costs, and they invest more than average in the Nordic countries, France, the Netherlands and the Slovak Republic.

4.4.2. Policy Scenario

There are many possible public policy interventions to foster firm-sponsored training. In the simulation, we concentrate on public training subsidies provided to the firm and assume that the government subsidises firm-sponsored training by a total amount of 0.3 percent of GDP.[43] Given that a major share of the total training costs of firms results from the opportunity costs of 'foregone labour input', we analyse a subsidy that is proportional to gross wages. It should be noted that training expenditures are calculated 'ceteris paribus', i.e. without taking into account behavioural adjustments of firms and workers. Thus, the 'true' amount of the training subsidy will be higher as firms will increase their training intensity due to the training subsidy.

4.4.3. General Economic Impact

The LMM distinguishes general skills, which result from training of workers, and firm-specific skills, which result from training sponsored by firms. As described in more detail in Part 3 of Berger et al. (2009), i.e. the Country Study for Germany, firm sponsored training is governed by an optimality condition of the firm which balances the firm's marginal costs of training on the one hand and the marginal return on the other hand. Simply speaking, the marginal return is determined by the increase of productivity minus the increase of wage costs which both result from a marginal increase of firm-sponsored training. In addition, the government can incentivize firm-sponsored training by providing a training subsidy.

Accordingly, a higher training subsidy stimulates firm-sponsored training and thereby boosts labour productivity in the firm. To a large extent, the direct effects of the government subsidy are determined by the two elasticities that deal with firm-sponsored training in the LMM. Note that we have changed the calibration of these elasticities compared to the previous project, a description of this change can be found in chapter 2.14. However, a training subsidy not only raises labour productivity and output of the firm directly but yields to further positive effects as well. Basically, the training subsidy increases the rent of a worker-firm match even if employees are trained at the same intensity as prior to the reform. Therefore, the subsidy creates additional incentives for job creation, similar to an employment subsidy. This implies that the results of the policy scenario will partly reflect the impact of an employment subsidy. Employers and employees will split the joint worker-firm surplus among them so that the

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[43] Given that investment in training of enterprises is around 1.5 percent of total labour costs and therefore only around 1 percent of GDP, we simulate a lower total amount of the subsidy than in the other policy reforms in this report.

subsidy, even though initially received by firms, causes wages (per productivity unit) to increase in order to let workers participate in the increase of the job rent. Therefore, wages will increase, both as a result of the higher productivity and because of surplus splitting.

The positive effect on employment implies that the productivity of capital increases, which induces firms to increase physical investment. Furthermore, a positive impact on the education decision of individuals can be expected. The initial amount of firm-sponsored training is higher for higher-skilled individuals in most countries. Due to its design, the simulated policy reform thus favours high-skilled individuals compared to low-skilled persons.

4.4.4. Comparative Static Results

Following the theoretical considerations in the previous chapter, we expect two main driving factors of the simulation scenario, namely (i) an increase of productivity per worker as a direct effect of the training subsidy and (ii) an increase of the number of workers as a result of the 'implicit employment subsidy'. The resulting long-run increase in what we call 'individual productivity' is illustrated in Figure 33. We define 'individual productivity' as

$$\theta = \theta^F * \theta^H,$$

i.e. it is the outcome of productivity resulting from firm-sponsored training, θ^F, and productivity of households, θ^H. This implies that our definition of individual productivity does not include the marginal product of labour, F_L, which, simply speaking, translates individual productivity into productivity within the production process. Individual productivity increases by around 0.1 percent of GDP in the 14 countries included in the LMM and the increase is nearly identical in all the countries so that the unweighted average increases by 0.1 percent as well.

Figure 33: Impact on 'Individual' Productivity, Training Subsidy
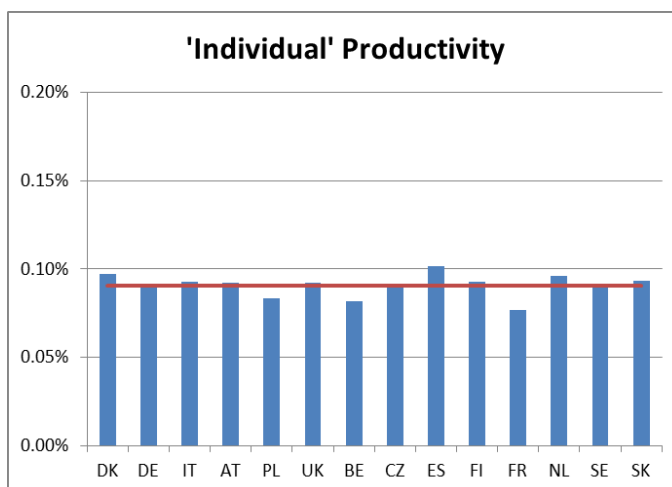
The second major driving force of the training subsidy is caused by the fact that it is an implicit employment subsidy. Ceteris paribus, i.e. even if firms do not increase their training intensity, the subsidy increases the rent of a worker-firm match. Wage bargaining implies that both parties split the joint surplus among them so that gross wages will increase, which is illustrated in Figure 34. On average of the countries modelled, wages increase by around 0.7 percent. Note that higher wages also reflect the increase of productivity, but the larger part of the wage increase stems from sharing the training subsidy. The impact of the reform is more pronounced in Spain. Similar to the other simulation scenarios, the volume of the reform scenario relative to aggregate labour income is higher in Spain as a result of the higher initial capital share.

Figure 34: Labour Costs per Hour, Training Subsidy
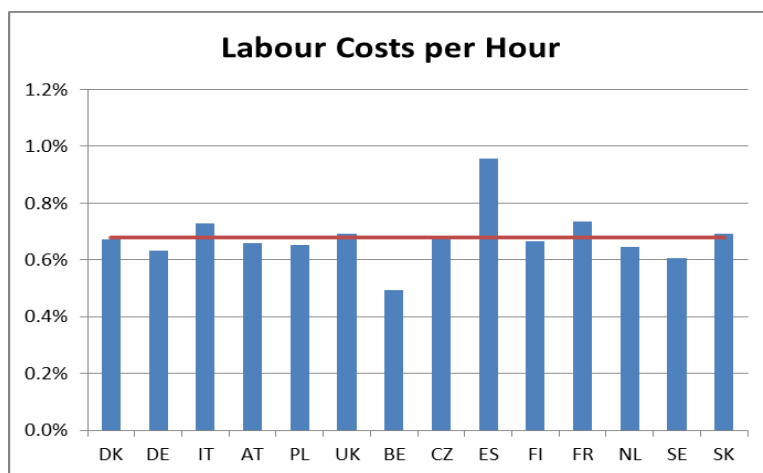
Figure 35: Employment, Training Subsidy
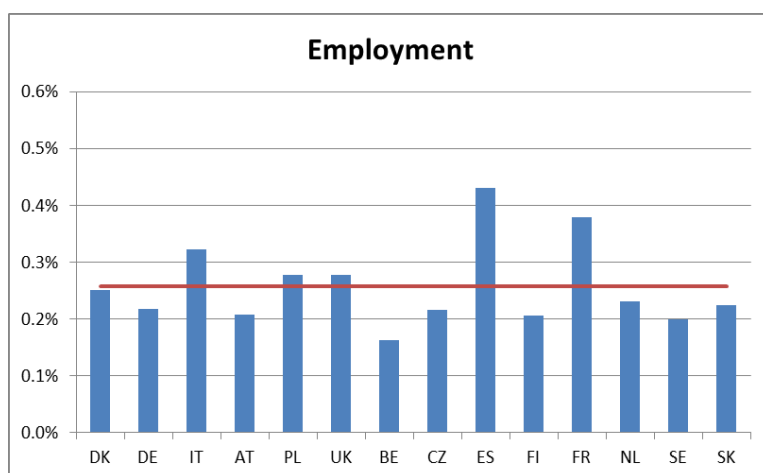
Despite of higher wages, firms benefit from the larger total job rent (training subsidy, higher productivity) which stimulates job creation. The rise in wages implies an increase of labour supply on several margins (participation, search intensity for a job if unemployed, intensive labour supply). As a result, employment increases. As illustrated in Figure 35, employment

(defined as the number of workers) increases by nearly 0.3 percent on average. Again, the impact is more pronounced in Spain, but it is also above average in France. In total, effective employment (which includes the increase of the number of workers, of productivity per worker and of the average number of hours worked) rises by 0.4 percent on average.

Figure 36 indicates that the increase of the number of workers is also reflected in a lower unemployment rate as a result of higher job creation of firms and higher search intensity of the unemployed. On average, the unemployment rate declines by around 0.1 percentage points in the long-run. Again, the positive impact is above average in Spain and France.

Figure 36: Unemployment Rate, Training Subsidy
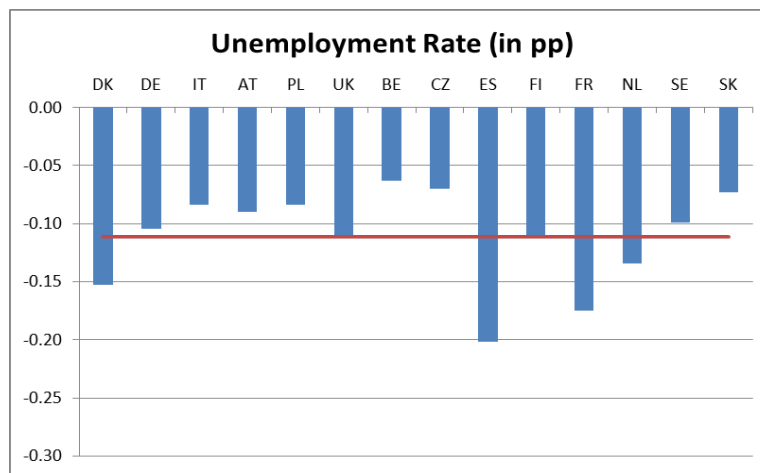
Figure 37: GDP, Training Subsidy
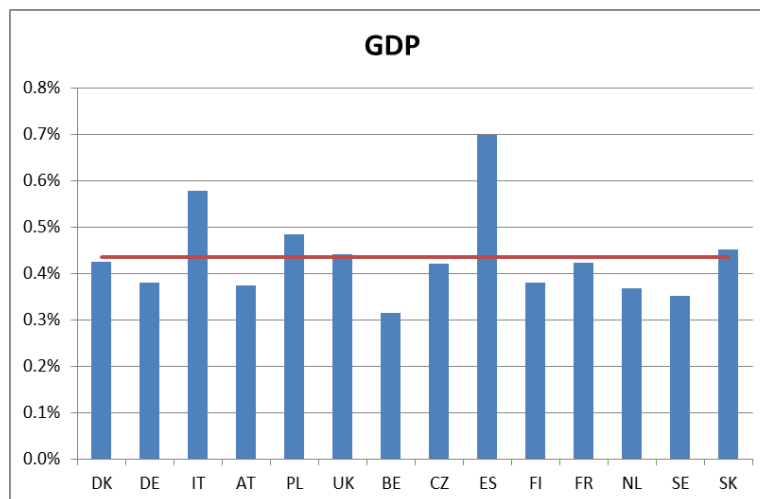
Due to the increase of employment, the rate of return of capital rises, which boosts investment incentives so that investment increases by 0.5 percent on average in the long-run. As a result of higher employment, higher productivity and a higher capital stock, the

training subsidy has a positive impact on GDP. As illustrated in Figure 37, a training subsidy that subsidises training by 0.3 percent of GDP ceteris paribus, causes an increase of GDP by 0.4 percent on average. In line with the effect on employment and investment, the impact is the strongest in Spain.

Given the increase of gross wages and employment, the training subsidy has a positive impact on net disposable income of households which implies that private consumption increases by 0.8 percent on average. As the training subsidy has a positive impact on all the major aggregates, tax revenues and social security contributions increase so that part of the subsidy is self-financing. As already stated in the other simulation scenarios, the degree of self-financing is dependent on the initial tax and contribution ratio in a country to a large extent. Ceteris paribus, an identical change of major macroeconomic aggregates (such as GDP, labour income, consumption) in two countries with a different tax ratio results in a more pronounced increase of tax and contribution revenues in the country with high tax rates. Thus, the degree of self-financing is higher in countries with a higher initial tax and contribution ratio. As illustrated in Figure 38, the degree of self-financing ranges from less than 30 percent to more than 80 percent (in Denmark) according to the model simulations.

Figure 38: Degree of Self-financing and Initial Tax Share, Training Subsidy
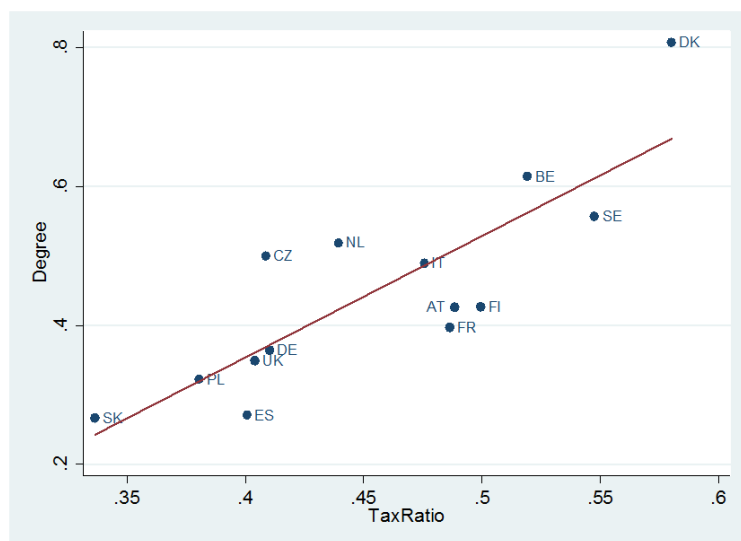
Table 32: Steady State Results of the Training Subsidy Reform

Training Subsidy Reform	DK	DE	IT	AT	PL	UK	BE	CZ	ES	FI	FR	NL	SE	SK	min	max	avg
GDP	0.43%	0.38%	0.58%	0.37%	0.48%	0.44%	0.32%	0.42%	0.70%	0.38%	0.42%	0.37%	0.35%	0.45%	0.32%	0.70%	0.43%
Capital Stock	0.50%	0.44%	0.76%	0.42%	0.63%	0.52%	0.38%	0.53%	0.84%	0.49%	0.44%	0.40%	0.45%	0.58%	0.38%	0.84%	0.53%
Consumption	0.72%	0.75%	0.84%	0.70%	0.75%	0.82%	0.57%	0.68%	1.14%	0.74%	0.87%	0.72%	0.68%	0.74%	0.57%	1.14%	0.77%
Gross wage rate (Labour costs per hour)	0.67%	0.63%	0.73%	0.66%	0.65%	0.69%	0.49%	0.68%	0.96%	0.66%	0.74%	0.65%	0.61%	0.69%	0.49%	0.96%	0.68%
-low	0.62%	0.39%	0.47%	0.45%	0.31%	0.55%	0.39%	0.38%	0.66%	0.51%	0.59%	0.55%	0.51%	0.35%	0.31%	0.66%	0.48%
-medium	0.64%	0.67%	0.75%	0.68%	0.64%	0.70%	0.49%	0.69%	1.03%	0.66%	0.81%	0.68%	0.58%	0.69%	0.49%	1.03%	0.69%
-high	0.70%	0.59%	0.81%	0.64%	0.61%	0.71%	0.51%	0.63%	1.05%	0.66%	0.79%	0.64%	0.63%	0.66%	0.51%	1.05%	0.69%
Net wage rate	0.67%	0.64%	0.71%	0.66%	0.65%	0.69%	0.49%	0.68%	0.96%	0.66%	0.77%	0.66%	0.60%	0.69%	0.49%	0.96%	0.68%
-low	0.62%	0.41%	0.48%	0.45%	0.31%	0.58%	0.39%	0.38%	0.68%	0.52%	0.68%	0.59%	0.52%	0.35%	0.31%	0.68%	0.50%
-medium	0.64%	0.68%	0.75%	0.69%	0.64%	0.70%	0.49%	0.69%	1.05%	0.66%	0.84%	0.69%	0.58%	0.69%	0.49%	1.05%	0.70%
-high	0.70%	0.60%	0.81%	0.64%	0.61%	0.71%	0.52%	0.63%	1.07%	0.67%	0.80%	0.65%	0.64%	0.66%	0.52%	1.07%	0.69%
Effective Employment	0.40%	0.34%	0.44%	0.34%	0.38%	0.42%	0.27%	0.36%	0.54%	0.33%	0.43%	0.36%	0.31%	0.37%	0.27%	0.54%	0.38%
Average number of hours worked per worker	0.06%	0.06%	0.05%	0.06%	0.05%	0.06%	0.04%	0.06%	0.08%	0.05%	0.07%	0.06%	0.05%	0.06%	0.04%	0.08%	0.06%
Participation rate - 15-69 yrs. (change in pp)	0.06	0.07	0.14	0.07	0.11	0.11	0.06	0.09	0.13	0.06	0.12	0.06	0.07	0.09	0.06	0.14	0.09
-low	0.08	0.06	0.12	0.07	0.12	0.12	0.06	0.07	0.15	0.07	0.21	0.08	0.09	0.06	0.06	0.21	0.10
-medium	0.07	0.08	0.15	0.08	0.12	0.13	0.06	0.10	0.16	0.07	0.11	0.07	0.07	0.10	0.06	0.16	0.10
-high	0.04	0.04	0.09	0.04	0.06	0.07	0.04	0.06	0.09	0.04	0.05	0.04	0.05	0.05	0.04	0.09	0.05
Employment (no. of workers)	0.25%	0.22%	0.32%	0.21%	0.28%	0.28%	0.16%	0.22%	0.43%	0.21%	0.38%	0.23%	0.20%	0.22%	0.16%	0.43%	0.26%
-low	0.02%	0.12%	0.07%	0.11%	0.25%	0.21%	0.02%	0.06%	0.23%	0.02%	0.66%	0.21%	-0.08%	0.05%	-0.08%	0.66%	0.14%
-medium	0.29%	0.19%	0.39%	0.20%	0.20%	0.25%	0.16%	0.19%	0.48%	0.16%	0.26%	0.22%	0.21%	0.18%	0.16%	0.48%	0.24%
-high	0.35%	0.33%	0.78%	0.30%	0.49%	0.36%	0.25%	0.40%	0.69%	0.34%	0.30%	0.27%	0.32%	0.45%	0.25%	0.78%	0.40%
Unemployment rate (change in pp)	-0.15	-0.10	-0.08	-0.09	-0.08	-0.11	-0.06	-0.07	-0.20	-0.11	-0.17	-0.13	-0.10	-0.07	-0.20	-0.06	-0.11
-low	-0.19	-0.12	-0.09	-0.10	-0.08	-0.15	-0.07	-0.06	-0.21	-0.12	-0.30	-0.17	-0.12	-0.05	-0.30	-0.05	-0.13
-medium	-0.15	-0.10	-0.08	-0.09	-0.09	-0.11	-0.06	-0.07	-0.22	-0.13	-0.16	-0.13	-0.09	-0.07	-0.22	-0.06	-0.11
-high	-0.13	-0.08	-0.05	-0.07	-0.05	-0.08	-0.04	-0.04	-0.15	-0.08	-0.08	-0.11	-0.08	-0.04	-0.15	-0.04	-0.08
"Individual" Labour Productivity	0.10%	0.09%	0.09%	0.09%	0.08%	0.09%	0.08%	0.09%	0.10%	0.09%	0.08%	0.10%	0.09%	0.09%	0.08%	0.10%	0.09%
new persons - low	-0.30%	-0.13%	-0.26%	-0.13%	-0.09%	-0.14%	-0.17%	-0.16%	-0.24%	-0.23%	-0.02%	-0.10%	-0.34%	-0.16%	-0.34%	-0.02%	-0.18%
new persons - medium	0.04%	-0.05%	0.08%	-0.01%	-0.09%	-0.06%	0.00%	-0.04%	0.00%	-0.07%	-0.07%	-0.01%	0.02%	-0.05%	-0.09%	0.08%	-0.02%
new persons - high	0.16%	0.18%	0.58%	0.17%	0.34%	0.17%	0.15%	0.27%	0.39%	0.20%	0.13%	0.10%	0.18%	0.33%	0.10%	0.58%	0.24%
Degree of Self-Financing	80.68%	36.43%	48.91%	42.64%	32.22%	34.97%	61.46%	49.94%	27.07%	42.66%	39.69%	51.86%	55.72%	26.72%	26.72%	80.68%	45.07%

4.4.5. Dynamic Results

When investigating short- and medium-run effects of a training subsidy to firms with the labour market model, one should keep in mind the limitations in our modelling of firm-sponsored training, as already described in Part III of Berger et al. (2009). We model net effects of training on productivity, reflecting gross productivity gains minus foregone production due to training time. When the policy shock sets in, firms start training but will realistically benefit from higher productivity with some delay. As can also be seen in the Tables in the Appendix, our model features immediate adjustment of ("individual" labour) productivity and might, thus, overestimate the true effect in the first period(s) to some extent. The dynamic effects of the policy reform will mostly be driven by the gradual adjustment of the capital stock and the skill decision of individuals.

The dynamic impact of the policy reform on GDP is illustrated in Figure 39. Similar to the other policy reforms, only a part of the long-run impact on GDP can be expected in the first years following the policy reform. Most obviously, even though the short-run increase of GDP is only moderately above average in Spain and Italy, the medium- and long-run impact is much more pronounced in these two countries. The reasons for this fact have already been discussed in previous chapters. First, the volume of the reform scenario relative to aggregate labour income is more pronounced in Spain as a result of the higher initial capital share, which implies a more pronounced increase of incentives. Second, the higher impact in Italy can to some extent be dedicated to an increase of the retirement age as labour market participation becomes more attractive compared to pension benefits. Third, the policy reform implies the strongest positive impact on the education (discrete human capital) decision. This can be illustrated, for instance, by the increase of the share of young individuals that decide to undergo tertiary education, see Figure 40. Obviously, the positive impact on the education decision is much more pronounced in Spain and Italy than in the other countries, which can partly be traced back to a more pronounced wage increase for high-skilled individuals. It should be noted, however, that a more pronounced increase of people investing in education will have a positive impact on GDP only after several years since these individuals still have to undergo education and do not participate on the labour market while in education.

Figure 39: Dynamic Impact on GDP, Training Subsidy
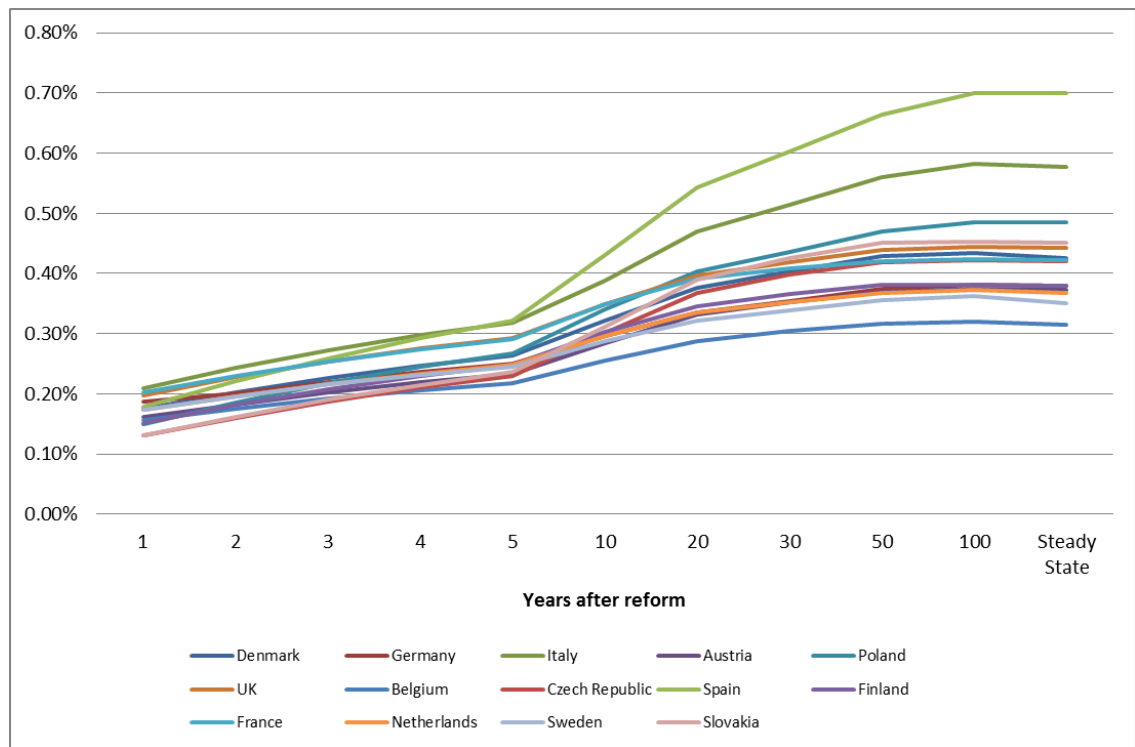
Figure 40: Dynamic Impact on „Newborn" High-skilled (in pp), Training Subsidy
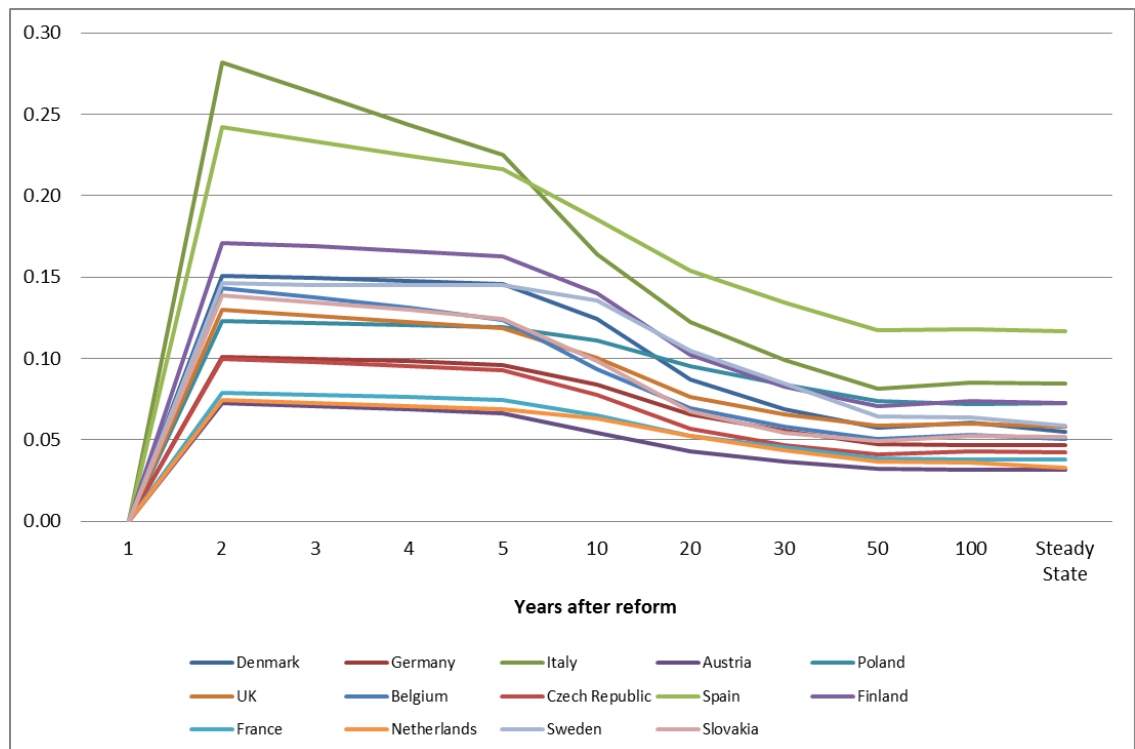
Figure 41 illustrates the impact of the training subsidy on employment in the different countries. In all the countries, the long-run increase of employment is more pronounced than the short-run increase. This can be attributed to the increase of the capital stock on the one hand and to the positive impact on the educational decision on the other hand. The most pronounced increase of employment can be found in Spain, France and, to a lesser extent, Italy. It must be noted, though, that the positive impact on employment is concentrated on low-skilled employment in France. Prior to the reform, firm-sponsored training is less concentrated towards high-skilled employment in France than in most other countries. Therefore, and as a result of the policy design, a larger part of the training subsidy is directed towards low-skilled employment. As a result of the lower average productivity of low-skilled individuals, GDP in France does not increase by more than in the other countries, even though the employment increase is much more pronounced. Furthermore, the positive impact on the educational decision is stronger in most other countries. Given that the employment rate increases with higher education, the employment effect remains fairly stable in France, whereas some other countries feature a pronounced medium- and long-run increase of the employment impact.

Figure 41: Dynamic Impact on Employment, Training Subsidy
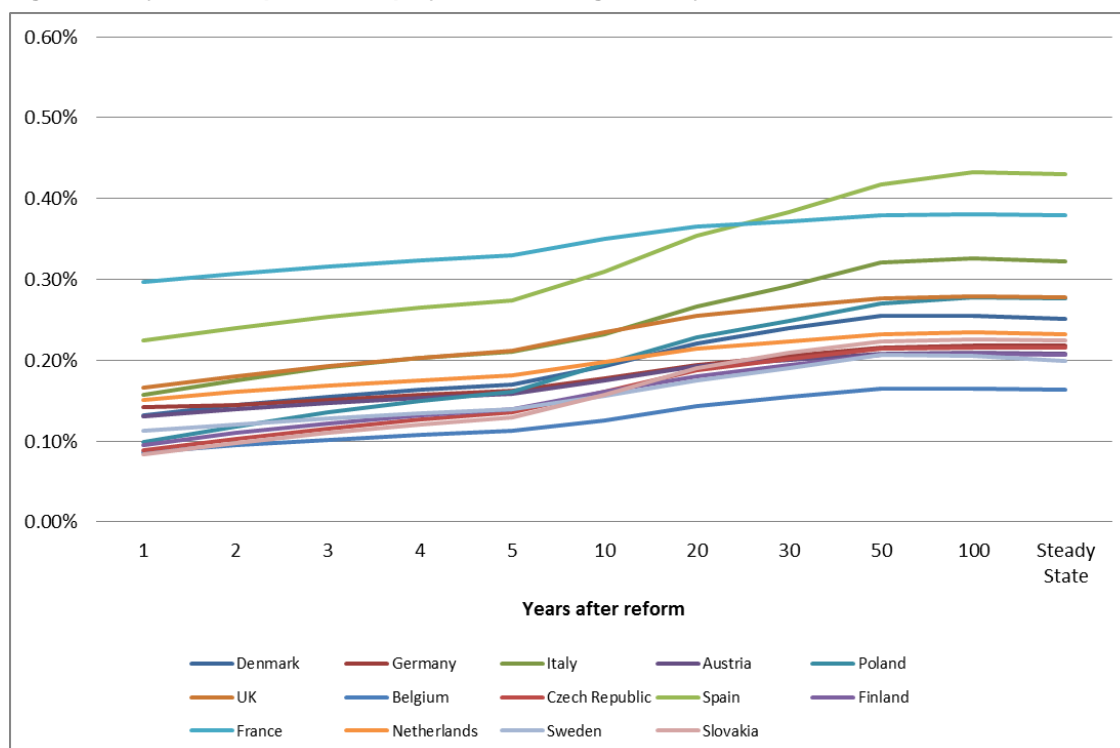
As can be seen in Figure 42, the impact on unemployment parallels the impact on employment. Again, the short-run decline is less pronounced than the long-run decline in all countries, which results from the increase of the capital stock and the medium- and long-run improvement of the educational structure. The strongest decrease of the unemployment rate

can be found in France and Spain. Whereas the short-run decline is more pronounced in France, the long-run impact is more pronounced in Spain.

Figure 42: Dynamic Impact on Unemployment (in pp), Training Subsidy
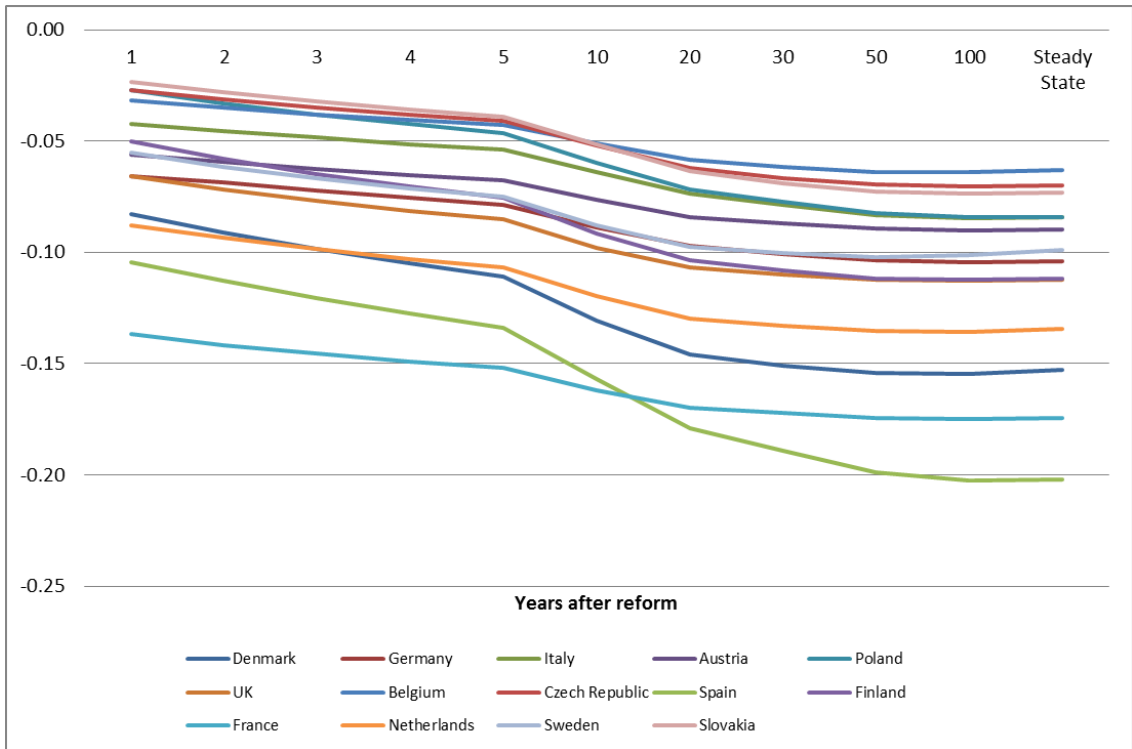
Figure 43: Dynamic Impact on Investment, Training Subsidy
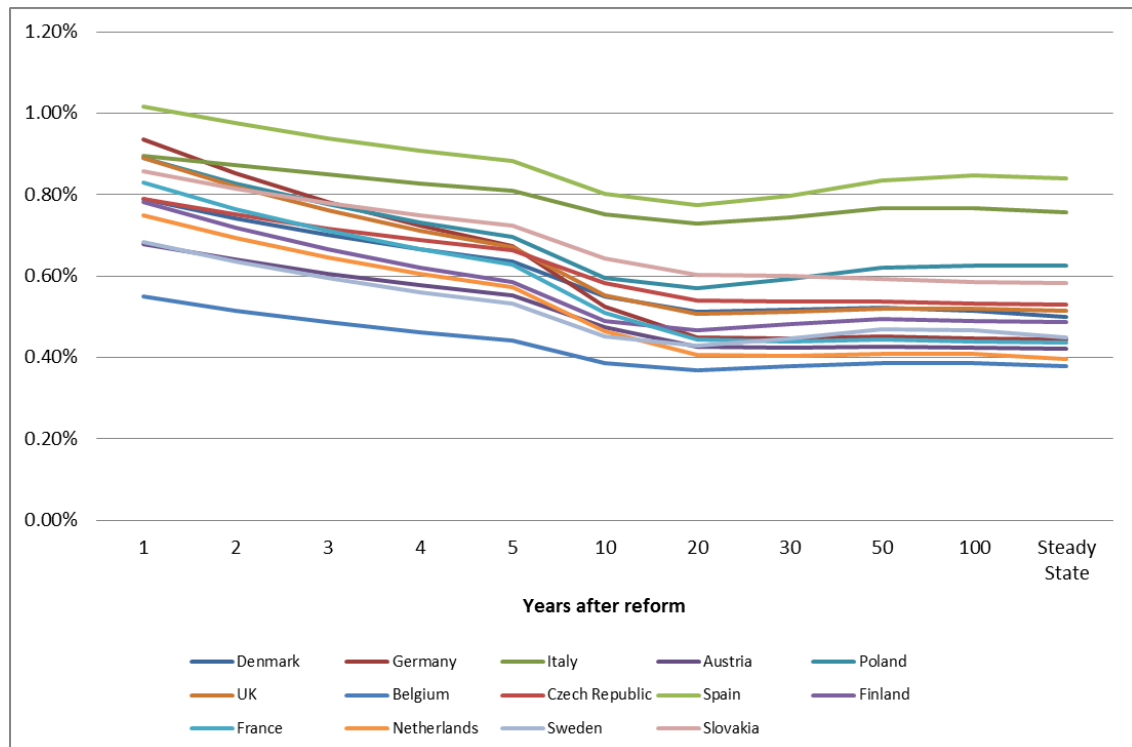
The dynamic effects of the policy reform on physical investment of firms can be found in Figure 43. Similar to the other policy reforms, the impacts on investment and GDP are closely related. Whereas the increase is most pronounced in Spain and Italy, it is least distinct in Belgium. Similar to the previous policy reforms, the increase of investment is stronger in the first years following the policy reform than in the medium- and long-run as firms adjust their capital stock to the increase of employment.

Figure 44 illustrates the degree of self-financing of the policy reform. Whereas it is *not* closely related to the impact on GDP or employment, it is closely related to the initial ratio of taxes and social security contributions on GDP, as already indicated in Figure 38. On the one hand, the degree of self-financing is high in countries like Denmark, Belgium and Sweden, where the impact on GDP is not above average but the tax ratio is. On the other hand, the degree of self-financing is comparably low in Spain and Italy, which feature the strongest GDP impact. The dynamic pattern of the degree of self-financing is fairly identical across all countries. It increases in the first years following the policy reform and reaches a peak 10 to 20 years after the reform. In the following years, the degree of self-financing declines again. This feature is related to the pension system. As employment increases and firms and employees bargain higher gross wages as a result of the training subsidy, the wage sum increases. Thus, individuals gradually build up higher pension benefits if these are earnings-related. Therefore, the policy reform implies an increase of pension expenditures over the years, which counteracts the positive impact on revenues to some (small) extent. As already described in the other policy reforms, the pattern is different in Germany, which can be explained by the fact that the adjustment of pensions in payment is directly linked to the development of wages.

Figure 44: Dynamic Impact on Degree of Self-financing, Training Subsidy
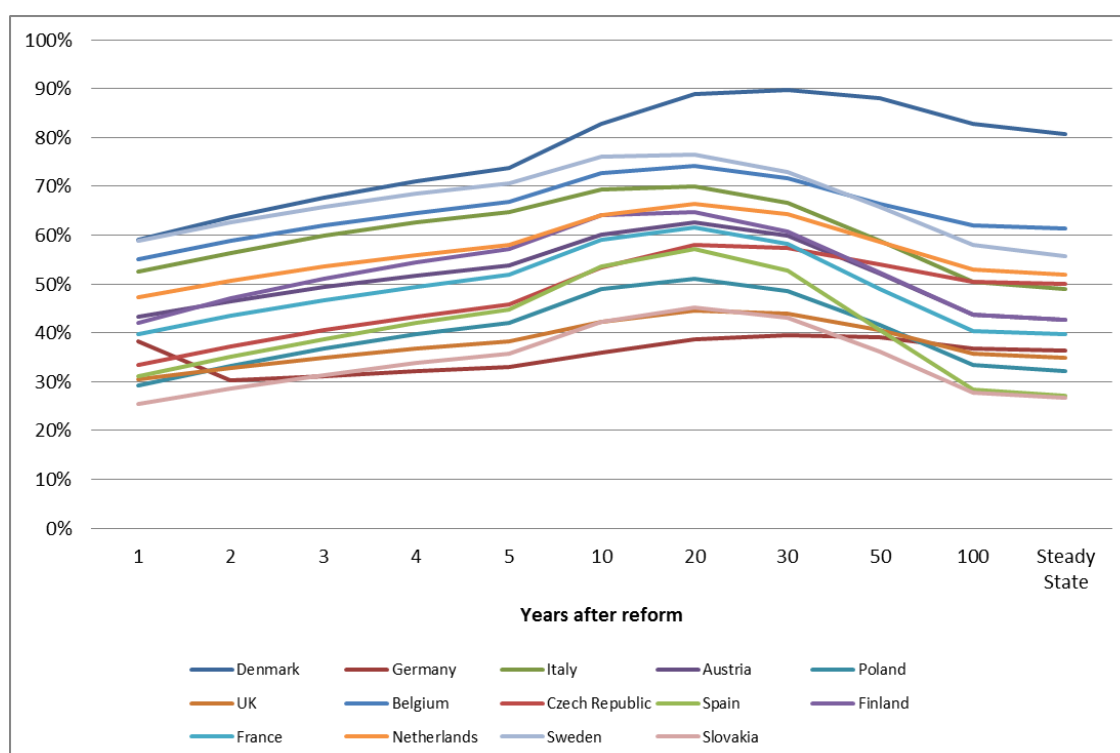
5. Appendix

5.1. Description of the Labour Market Model

This section provides a short description of the LMM. Part II of Berger et al. (2009) consists of a much more detailed documentation. LMM is a dynamic computable general equilibrium model featuring a detailed representation of the labour market. Its equations are derived from an in-depth micro-foundation for the actors involved, namely households (workers and retirees) and firms. Individuals maximize their lifetime utility by choosing the optimal number of hours worked if employed, the search intensity for a job if unemployed, participation in the labour market, and the retirement age. They also choose an optimal educational investment at the beginning of their lifetime (age 15), the effort invested in lifelong learning and an optimal inter-temporal allocation of consumption. Featuring eight different age groups (four of which are of working age, three considered retiree groups and one 'mixed group' including people of working age but eligible to retire) and three different skill groups (i.e. low- (ISCED[44] 0-2), medium- (ISCED 3-4) and high-skilled (ISCED 5-6) individuals), the structure of the household sector is particularly detailed. Based on work of Grafenhofer et al. (2007a, b) and Jaag et al. (2010), an Overlapping Generations (OLG) model in the spirit of Samuelson (1958) and Diamond (1965) is used in order to allow for life-cycle specific behaviour.

The model contains search unemployment based on the pioneering theory reviewed by Mortensen (1986). A static search model as in Boone and Bovenberg (2002) is used in contrast to a dynamic model as in Pissarides (2000). The static model is simpler, yet it captures the essential insights of the dynamic one. Separate matching functions are introduced for the different age and skill groups allowing for age- and skill-specific unemployment rates and policy reforms. Given the bargaining power of workers and firms, employers and employees bargain over wages. Firms produce goods by combining capital and age- and skill-dependent labour input. In particular, a three-step CES-function is used to capture the feature of capital-skill complementarity. Firms maximize the present value of profits by optimally choosing the number of vacancies, the share of workers laid-off, the amount of firm-sponsored training, and investment according to Hayashi's q-theory (1982).

The model captures a detailed description of the public sector and institutions (like passive labour market policy). The budget of the public sector is divided into a budget for social insurance revenues and expenditures and a general budget financing other expenses. Revenues of the general budget comprise all main taxes, e.g. personal and corporate income tax, consumption taxes, capital and capital gains taxes. Public expenditures include government consumption, transfers to the social security systems and to households, subsidies to firms and debt servicing. Expenditures for social insurance are financed by contributions of employers and employees and transfers from the general budget.

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[44] International Standard Classification of Education as designed by UNESCO (2006).

Actual economic data and empirical estimates are used to calibrate the model. For the original project, the calibration has been performed for six Member States, namely Austria, Denmark, Germany, Italy, Poland, and the UK. In this project, the model is extended to include Belgium, the Czech Republic, Spain, Finland, France, the Netherlands, Sweden and Slovakia. As mentioned in the *List of Policy Scenarios* in the Final Report of the previous project and indicated in the *Country Study for Germany* and the *Illustrative Simulations* for the other countries, LMM is capable of analysing a wide range of labour market policy reforms and changes of other external factors. For instance, simulation scenarios may include tax reforms, changes of pension regimes, implementation of active labour market policies, policies to foster human capital formation (education and training), changes of the employment protection legislation regime, or financial support to employers or employees for low-income jobs.

Simulation results include effects of reforms on macroeconomic variables such as GDP, investment, private consumption, unemployment and employment rates, wages and productivity. Household-specific variables can be presented in an aggregate manner but also on a more disaggregated level such as age- and/or skill-dependent. Inter- as well as intra-generational and inter-temporal effects of reforms can be analysed with the model.

5.2. List of Variables to be Updated

Table 33 provides a comprehensive list of all those parameters and variables for which an update is necessary, arranged according to their economic characteristic. We differentiate macroeconomic, demographic and labour market parameters and variables and characteristics of the relevant national public institutions. Apart from a description of the variables, the Table includes information on the type of the variables, their unit or scale and their dimension. The Unit/Scale entry provides information on how the empirical value is translated into the model. Many of the parameters or variables are normalised. For example, the number of hours worked is normalised to one for the youngest low-skilled group. Furthermore, Table 33 provides the data sources on which the calibrated values are based. In this column, the expression 'institutional detail' indicates that the 'prime source' for the calibration of the variable is the institutional setting in a country (information is mostly taken from MISSOC, the OECD or national sources). For many parameters, the calibration of institutional details is partly linked with other data sources. For instance, to calibrate the age-and skill structure of taxes and social security contributions, we apply the institutional setting (tax rates) to income data of the EU-SILC with the help of the OECD Tax and Benefit models. The column 'Reference' provides information where the values can be found. This refers to the Excel files where the calibration is performed or the location in reports where the information can be found (in that case, 'Report' refers to Berger et al. (2009)). For completeness, Table 34 lists the variables that are currently included in the 'DataInputXX'-files but for which an update is not necessary.

Table 33: List of Variables to be Updated

Macroeconomic						
Parameter/Variable	Description	Type	Unit/Scale	Dimension	Data Source	Reference
scalingfactor[1]	gross value added (to scale values)	endogenous var.	in 100 billions of national currency	scalar	Eurostat	SystemofNationalAccounts.xlsx
K	capital stock	endogenous var.	in percent of GDP	scalar	OECD STAN database	SystemofNationalAccounts.xlsx
r	exogenous real interest rate	parameter	in percent	scalar	literature	
gx	exogenous real growth rate	parameter	in percent	scalar	data (but same for all)	
tb	trade balance	endogenous var.	in percent of GDP	scalar	Eurostat	SystemofNationalAccounts.xlsx
dg	government debt	endogenous var.	in percent of GDP	scalar	Eurostat	SystemofNationalAccounts.xlsx
isk	capital share	endogenous var.	in percent	scalar	Eurostat	SystemofNationalAccounts.xlsx
ch	public health expenditures	policy parameter	in percent of GDP	scalar	OECD Health Data	PublicHealthUpdate.xlsx

Demographic						
Parameter/Variable	Description	Type	Unit/Scale	Dimension	Data Source	Reference
gamv	probability of surviving	parameter	in percent	8x1	Eurostat	DemographyUpdate.xlsx
skill_distribution	share of different skill groups in total population	endogenous var.	in percent	1x3	Eurostat	SkillStructureEUUpdate.xlsx

Labour Market						
Parameter/Variable	Description	Type	Unit/Scale	Dimension	Data Source	Reference
eff	number of hours spent working	endogenous var.	normalized to 1 for young low-sk.	5x3	LFS	LFS_variables_xxx.xlsx, Sheet effort
heff	number of hours spent in training	endogenous var.	relative to eff[1,1][2]	5x3	LFS	LFS_variables_xxx.xlsx, Sheet heff-calc
hefffirm	amount of firm-sponsored training	endogenous var.	relative to eff[1,1][2]	5x3	LFS	LFS_variables_xxx.xlsx, Sheet heff-calc
partrate	participation rate	endogenous var.	in percent	5x3	LFS	LFS_variables_xxx.xlsx, Sheet participation
deltabar	share of individuals not disabled	exogenous var.	in percent	8x3	EU-SILC	EUSILC_variables_xxx.xlsx, Sheet deltabar
u	unemployment rate	endogenous var.	in percent	5x3	LFS	LFS_variables_xxx.xlsx, Sheet unemployment
emplfac	prob. of having a job without searching	input for exog. var.[3]	in percent	5x3	LFS	LFS_variables_xxx.xlsx, Sheet emplfac
layoffshare	Share of layoffs of separations	input for end. var.[3]	in percent	5x3	LFS, EU-SILC	layoffshare.xlsx
wagemincer	age-dependent wage profile	input for end. var.[3]	relative to wage[youngest work,.][4]	5x3	EU-SILC	EUSILC_variables_xxx.xlsx, Sheet Mincerxxxreg
skillwagemincer	skill-dependent wage profile	input for end. var.[3]	relative to youngest low-skilled	1x2	EU-SILC	EUSILC_variables_xxx.xlsx, Sheet Mincerxxxreg
wagmincerflag	do Mincer estimates refer to net or gross wages?		binary	scalar		
hiringcosts	aggregate hiring costs	endogenous var.	as percent of labour costs	1x3	empirical literature	
consumption profile	private consumption profile	endogenous var.	relative to priv. cons. of age 20-24	8x1	Eurostat	consumptionprofileupdate.xlsx

[1] as GVA is normalised to 100 in the model, this number is only necessary to get a reference to the actual figures; [2] number of hours spent working of the youngest low-skilled; [3] a variable is derived from this input in 'calib'; [4] wage of youngest age group at the labour market of each skill group.

Table 33 (contd.): List of Variables to be updated (Public System I)

Parameter/Variable	Description	Type	Unit/Scale	Dimension	Data Source	Reference
Public System I						
Expenditure and Revenue Shares, Tax Rates						
shtcons, shtw, shtssc	various revenue shares	endogenous var.	as percent of GDP	scalars	OECD Rev. Stat., EU-KLEMS	TaxStructuresUpdate.xlsx, SystemofNationalAccounts.xlsx
shtprof, shtindiv	various revenue shares	endogenous var.	as percent of GDP	scalars	OECD Rev. Stat., EU-KLEMS	TaxStructuresUpdate.xlsx, SystemofNationalAccounts.xlsx
shtcap, firmsubsidies	various revenue shares	endogenous var.	as percent of GDP	scalars	OECD Rev. Stat., EU-KLEMS	TaxStructuresUpdate.xlsx, SystemofNationalAccounts.xlsx
shynonpar	total amount of social assistance	endogenous var.	as percent of GDP	scalar	EU-SILC, OECD	EUSILC_variablesxxx.xlsx, Sheet socialexcl
shlump	total amount of lump-sum transfers	policy parameter	as percent of GDP	scalar	EU-SILC, OECD	EUSILC_variablesxxx.xlsx, Sheet lump-sum total
tprof	effective marginal corporate income tax rate	policy parameter	in percent	scalar	ZEW (2009), for DG TAXUD	
factctotcg	share of public consumption taxed by cons. taxes	policy parameter	in percent	scalar	Eurostat	SharePublicConsumptionTaxedbyConsumptionTaxes.xlsx
Pension System						
Parameter/Variable	Description	Type	Unit/Scale	Dimension	Data Source	Reference
mp	pension accrual rate of labour income	policy parameter	in percent of gross labour income	5x3	institutional detail	PensionsUpdate.xlsx
m1	pension accrual rate independent of labour income	policy parameter	in percent of labour costs	5x3	institutional detail	PensionsUpdate.xlsx
b1	consideration of unempl. periods for pension benefits	policy parameter	in percent of gross labour income	5x3	institutional detail	PensionsUpdate.xlsx
pinc	indexation of pension claims	policy parameter	in percent	8x3	institutional detail	PensionsUpdate.xlsx
sig0m, sig1m	determination of supplem. for pension contr. of mixed gr.	policy parameters	in percent	1x3	institutional detail	PensionsUpdate.xlsx
corrm	reference for the accumul. of pension points of mixed gr.	policy parameter	$\in [0,1]$	scalar	institutional detail	PensionsUpdate.xlsx
sig0p, sig1p	determination of supplem. for pension stock of mixed gr.	policy parameters	in percent	1x3	institutional detail	PensionsUpdate.xlsx
corrp	reference for the pension corridor (stat. retirement age)	policy parameter	$\in [0,1]$	1x3	institutional detail	PensionsUpdate.xlsx
pensinvfac	imputation of times of dis. pensions for pension points	policy parameter	in percent	5x3	institutional detail	PensionsUpdate.xlsx
va2	adjustment factor in disability pension system	policy parameter	in percent of pension points	8x3	institutional detail	Pensions_xxx.xlsx, Sheet pensionrepl
p00early	flat disability pension benefit	policy parameter	in percent of labour costs	8x3 (5x3)	institutional detail	PensionsUpdate.xlsx
p00	flat pension payments	policy parameter	in percent of labour costs	8x3 (4x3)	institutional detail	PensionsUpdate.xlsx
expenpenscalib	pension expenditures	endogenous var.	as percent of GDP	scalar	OECD Soc.Exp., other	SocialExpendituresAggOECD-SILC.xlsx
Unemployment Insurance and Social Benefit System						
Parameter/Variable	Description	Type	Unit/Scale	Dimension	Data Source	Reference
lump_00	structure of lump-sum transfers to households	policy parameter	share (sum of 8x3 entries is 1)	8x3	EU-SILC	EUSILC_variablesxxx.xlsx, Sheet lump-sum total
xi1	share of unempl. benefits indexed to prev. earnings	policy parameter	in percent	5x3	inst. detail, EU-SILC	EligibilityandReplRate.xlsx
brepl	unemployment repl. rate of earnings-related benefits	policy parameter	in percent	5x3	inst. detail, EU-SILC	EligibilityandReplRate.xlsx
b_00	benefits for unemployed not indexed to prev. earnings	policy parameter	in percent of labour costs	5x3	inst. detail, EU-SILC	EligibilityandReplRate, EUSILC_variablesxxx.xlsx

Table 33 (contd.): List of Variables to be Updated (Public System II)

Public System II						
Life-Cycle- and Skill-Structure of Tax/Benefit System						
Parameter/Variable	Description	Type	Unit/Scale	Dimension	Data Source	Reference
ynonpar	social assistance for inactive individuals	policy parameter	relative share	4x3[5]	EU-SILC	EUSILC_variablesxxx.xlsx, Sheet socialexcl
twavgstart	'initial' income tax rate of workers[6]	policy parameter	in percent	5x3	OECD, inst. Detail, EU-SILC	EUSILC_variablesxxx.xlsx, Sheet taxwage
twpavgstart	'initial' income tax rate of retirees[6]	policy parameter	in percent	4x3	OECD, inst. Detail, EU-SILC	EUSILC_variablesxxx.xlsx, Sheet taxwage
twearlyavgstart	'initial' income tax rate of disability pensions[6]	policy parameter	in percent	5x3	OECD, inst. Detail, EU-SILC	EUSILC_variablesxxx.xlsx, Sheet taxwage
tsscwavgstart	'initial' soc. sec. contr. rate of employees[6]	policy parameter	in percent	5x3	OECD, inst. Detail, EU-SILC	EUSILC_variablesxxx.xlsx, Sheet ssc
tsscfavgstart	'initial' soc. sec. contr. rate of employers[6]	policy parameter	in percent	5x3	OECD, inst. Detail, EU-SILC	EUSILC_variablesxxx.xlsx, Sheet emplcontr
tsscpavgstart	'initial' soc. sec. contr. rate of retirees[6]	policy parameter	in percent	4x3	OECD, inst. Detail, EU-SILC	statutory rates
tsscearlyavgstart	'initial' soc. sec. contr. rate of disability pensions[6]	policy parameter	in percent	5x3	OECD, inst. Detail, EU-SILC	statutory rates, EUSILC_variablesxxx.xlsx
tuavgstart	'initial' income tax rate of unemployed[6]	policy parameter	in percent	5x3	OECD, inst. Detail, EU-SILC	statutory rates, EUSILC_variablesxxx.xlsx
tufixavgstart	'initial' income tax rate of flat unempl. Benefits[6]	policy parameter	in percent	5x3	OECD, inst. Detail, EU-SILC	statutory rates, EUSILC_variablesxxx.xlsx
tsscuavgstart	'initial' soc. sec. contr. rate of unemployed[6]	policy parameter	in percent	5x3	OECD, inst. Detail, EU-SILC	statutory rates, EUSILC_variablesxxx.xlsx
tsscufixavgstart	'initial' soc. sec. contr. rate of flat unempl. Benefits[6]	policy parameter	in percent	5x3	OECD, inst. Detail, EU-SILC	statutory rates
zw, zu	flat social transfer paid to workers and unemployed[7]	policy parameters	in percent of labour costs	5x3	EU-SILC	EUSILC_variablesxxx.xlsx
xtaxw, xtaxearly	share of ssc of workers/disabled deductible from inc. tax	policy parameters	in percent	5x3	OECD, inst. Detail, EU-SILC	instit. detail, EUSILC_variablesxxx.xlsx
xtaxp	share of ssc of retirees deductible from income tax	policy parameter	in percent	4x3	OECD, inst. Detail, EU-SILC	instit. Detail
assessmentfactor	share of labour income s.t. soc. sec. contribution	policy parameter	in percent	5x3	EU-SILC	Pensionsxxx.xlsx, Sheet assessmentpensionxxx
taxtau_s0	tax rate on severance payments	policy parameter	relative to inc. tax [0], in perc. [1]	5x3	institutional detail	TaxationBenefits.xlsx
taxtau_s0-flag	flag related to taxtau_s0 (see above)		binary	scalar		TaxationBenefits.xlsx
zf	flat soc. sec. contr. of firm	policy parameter	in percent of labour costs	5x3	institutional detail	TaxDenmark.xlsx
EPL Parameters						
Parameter/Variable	Description	Type	Unit/Scale	Dimension	Data Source	Reference
EPL-Index	overall EPL index	policy parameter	relative to Germany	scalar	OECD	EPLUpdate.xlsx
ts-share	relative importance of severance payments	policy parameter	in percent of total EPL	scalar	OECD	EPLUpdate.xlsx
tenure	tenure in job	'endogenous' var.	relative to tenure[1,1]	5x3	LFS	EPLUpdate.xlsx
tau_s0, tau_c0, tau_f0[8]	firing costs	policy parameter	in percent of labour costs	5x3		EPLUpdate.xlsx

[5] no social assistance for mixed group (non-participants are retired); [6] 'initial' in the following sense: the structure of tax rates determined here, but the amount determined by revenue shares; [7] zu is only paid to unemployed persons receiving earnings-dependent unemployment benefits, [8] these parameters are necessary for Germany; for all other countries, the parameters used in the model are calibrated via tenure, eplindex and ts-share;

Table 33 (contd.): List of Variables to be Updated

General Model Parameters (Currently Identical for all countries) in 'Param'						
Production						
Parameter/Variable	Description	Type	Unit/Scale	Dimension	Data Source	Reference
sigprod	substitution elasticity in production	parameter		1x3	empirical lit.	Report, p. 75, elasticities, elasticities.xlsx
psi	scaling factor for capital adjustment costs	parameter		scalar	empirical lit.	Report, p. 78, elasticities, elasticities.xlsx
Labour Supply Elasticities						
Parameter/Variable	Description	Type	Unit/Scale	Dimension	Data Source	Reference
v_l	intensive labour supply elasticity	preference par.		1x3	empirical lit.	Report, p. 72
v_par	connected with participation elasticity	preference par.		4x3	empirical lit.	Report, p. 72, elasticities, elasticities.xlsx
v_par retirement	connected with retirement elasticity	preference par.		1x3	empirical lit.	Report, p. 73, elasticities, elasticities.xlsx
eps_d	education costs	parameter		scalar	empirical lit.	Report, p. 86, elasticities, elasticities.xlsx
sig	intertemporal elasticity of substitution	preference par.		1x3	empirical lit.	Report, p.71
Human Capital						
Parameter/Variable	Description	Type	Unit/Scale	Dimension	Data Source	Reference
alphahumcap	individual human capital production function exponent	parameter		5x3	empirical lit.	Report, p. 87
alphafirm	HC production function firm-spons. training exponent	parameter		5x3	empirical lit.	Report, p. 87
htfp	individual HC production function factor	parameter		5x3	empirical lit.	Report, p. 87
epsthetaheff	elast. of productivity w.r.t. to firm-sponsored training	parameter		scalar	empirical lit.	Current Report, ch. 2.14
elfirmhumcostvalue	exponent of firm-sponsored training costs	parameter		scalar	empirical lit.	Current Report, ch. 2.14
thetanb_00	productivity of 'newborns'	parameter	relative to prod.[youngest work,.][9]	1x3	EU-SILC	EUSILC_variables_xxx.xlsx, Sheet Mincerxxxreg
Labour Market Parameters						
Parameter/Variable	Description	Type	Unit/Scale	Dimension	Data Source	Reference
barg	bargaining power of firms	parameter		1x3	empirical lit.	Report, p. 84
sigma	exponent of matching function	parameter		5x3	empirical lit.	Report, p. 83
match00	factor of matching function	parameter		5x3	empirical lit.	Report, p. 83
v_u	job search costs	preference par.		5x3	empirical lit.	Report, p.73, elasticities, elasticities.xlsx
epsvac	vacancy costs	parameter		5x3	empirical lit.	Report, p.78
v_f	managerial costs	parameter		scalar	empirical lit.	Report, p. 79, elasticities, elasticities.xlsx

[9] productivity of youngest age group on the labour market of each skill group;

Table 34: List of Variables for which an Update is not necessary

Variables in 'DataInput', that do not need to be updated			
Parameter/Variable	Description	Type	reason
twsocass, tusocass	potential 'social assistance tax' rates	policy parameters	is currently set to zero for all countries
GDP	GDP as in SNA		not used in model
deltap	'depreciation' of pension rights	policy parameter	is currently set to zero for all countries
va1	adjustment of pension payments	policy parameter	is currently set to one for all countries
breplgross	indicator, whether replacement rate is net or gross		not used in model
delta	depreciation rate of capital	parameter	calibrated in the model, given the capital stock

5.3. Specific Information for Modelling Experts

5.3.1. Pension System

This chapter provides some information on the way we model pension systems that are of interest mainly for modelling experts of the European Commission. We provide some insight on our general approach of modelling the pension systems, but also some country-specific details.

General Information

Some countries (the United Kingdom for instance) do not provide certain pension benefits before the statutory retirement age. In contrast to that, our modelling approach assumes that individuals receive pension benefits also if they retire earlier (see, for instance, the first order condition for retirement). At a first sight, one would assume that these two approaches do not match. However, if we assume actuarially fair adjustments to the pension benefits, our approach is in line with the institutional settings, both in terms of pension expenditures of the government and labour market incentives (both incentives to acquire pension rights and incentives to retire).

Some countries, such as Finland, are explicitly connecting future reductions of pension benefits to the development of life expectancy. As we are keeping life expectancy constant in a standard simulation, we do not take into account the reductions of future pension benefits. However, in case that one intends to model demographic ageing, these reductions should be taken into account.

Denmark and the United Kingdom pay flat disability benefits. At retirement age these disability benefits are converted to old-age pension benefits. In contrast to the other countries, where earnings-related disability benefits are reflected in the individual EU-SILC data, it is not possible to extract them for these two countries. Our simple approach is thus to assume that disabled persons get the same amount of earnings-related pensions than non-disabled individuals. Although this probably results in a too high pension benefit, we do not see a better way. Furthermore, the 'deviation' due to wrong incentives (a slightly too high shadow value of accumulated pension points) is probably small as it only affects the share of disabled individuals.

Pension benefits credited for childcare are not explicitly taken into account. Given that we do not model the fertility decision endogenously, it seems sufficient to us that these benefits are implicitly taken into account by the adjustment of the flat pension benefit ('p00adjustment').

LMM includes occupational pension schemes for some countries, which are not included in OECD's Social Expenditure. The Gauss file 'OccupationalPensionExp' derives expenditures

of these occupational systems within the LMM. Subsequently, aggregate pension expenditures are adjusted by this amount.

Denmark

Under some conditions, early retirement is possible in Denmark via a voluntary early retirement programme linked with unemployment insurance. We include both the contributions to and the benefits from this system in the model. Technically, this benefit is modelled as a flat pension 'p00' in case of early retirement. Given that this benefit is higher than the basic flat pension, we have to correct for too high benefits to households by subtracting the appropriate difference from lump-sum transfers to the households, see also the file PensionsUpdate.xlsx.

Germany

Pension entitlements of those unemployed who receive 'Arbeitslosengeld I' are taken into account in the earnings-related part (reflected in the variable 'b1' in the model). Entitlements connected with 'Arbeitslosengeld II' are considered in the labour market participation part ('m1' in the model) as they are 'flat' in the sense that they are independent of (previous) earnings.

Finland

We do not include the flat basic state pension into the model. The national pension is reduced by 50% with higher earnings (so that no basic pension is paid at all once the earnings-related pension exceeds around EUR 1,100) and the amount of flat pensions is changed in the calibration procedure anyhow to reflect total pension benefits.

Modelling of the Finish pension system provides some challenges as the accrual rate and deductions are age-dependent (first, the accrual rate increases from 1.9% for individuals aged 53 to 62 years to 4.5% for people aged 63 to 67; second, there are only deductions if one retires below the age of 63 and no actuarial adjustment happens between 63 and 68 because of the higher accrual rate for this age group). We decided to proceed in the following way: we assume an accrual rate of 1.9% also for people older than 63 and 'look' for deductions that give us the same pension incentives as if we would model the true system. We found that the deductions/supplements should be around 0.33% per month of earlier/later retirement.

France

Taking into account the right incentives for a pension system that is based on (i) the average earnings of the best 25 years and (ii) the total number of periods of insurance is tricky. There

are still incentives to contribute early in lifetime because of (i) getting a period of insurance but also (ii) contributing to the best 25 years if for some reason earnings later in lifetime are not expected to be higher. We therefore decided to follow the following approach: (i) calculate an 'actual' pension for an individual who contributes for 40 years (at an earnings profile that is determined by the Mincer estimation) and (ii) calculate a 'lifetime' accrual rate that is necessary to yield the same pension benefit (see the file 'calculationsPension'.xlsx) for this individual.

Finding deductions for early retirement is tricky. In the occupational pension scheme, we assume deductions of 4% per year, calculated from the pension age of 65. In the earnings related scheme, each year after the statutory retirement age (60) increases the benefit by 5%. Early retirement in that scheme is only possible under rather strict conditions. We therefore assume a weighted average of these two deductions.

Netherlands

In the Netherlands, a *flat basic* pension is only payable from the statutory retirement age onwards. As we do not take into account actuarial adjustment of *flat* pension benefits in the model, giving the full basic pension to people who retire earlier would result in wrong incentives (individuals would receive the pension benefit if they retire earlier). In that case, we model this flat pension for the age group 55-69 as a lump-sum payment to individuals[45] and as a flat pension for the older age groups.

Poland

The government pays the contributions to the pension system during unemployment (based on the unemployment benefit). As the benefit is a flat benefit and not earnings-related, we model this contribution in the part connected to labour market participation (reflected in 'm1' in the model) instead of the earnings-related part ('b1' in the model).

Spain

For the calculation of the accrual rate, we take an approach similar to the method for France.

Receipt of unemployment benefits creates pension credits as the government takes over part of the contributions in case of unemployment. However, unemployment assistance does not create any pension credits, except for people aged 52 or older. Given that we don't have better data information, we try to approximate the share of people receiving unemployment

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[45] The amount of the basic pension is divided by three to take into account that the pension is paid from the age of 65.

benefits among those people receiving benefits or assistance (both are part of the share 'xi1') by the share of people who are unemployed for less than one year.

Slovak Republic

A funded system was introduced in 2005 and individuals can choose between totally remaining in the earnings-related PAYG scheme and partly opting out into the new system. Based on the following two figures, we assume that 50% of individuals partly switch (both figures are taken from ASISP (2010)): i) at the beginning, around 60% joined the second pillar, but some of them (around 10%) switched back again; ii) no more than 40% of young people decided to join in recent years (which is maybe 'distorted' downwards due to low or negative rates of return of the funded part due to the crisis). The rate of return is thus partly determined by the rate of return of the PAYG part and partly by the rate of return of the funded part.

United Kingdom

According to OECD (2011), 'only' 35 percent of employees contract out of the state second pension. In addition, 'the Pensions Act 2007 includes measures to abolish contracting-out on a defined contribution basis, expected to happen from 2012'. Thus, contrary to the first project, we take into account the state second pension instead of the 'contracted out' pension.

5.3.2. Unemployment System

General Information

In the following, the terms overall eligibility rate and overall replacement rate refer to the eligibility for unemployment payments and the average gross replacement rate independent from the source of benefit, meaning either unemployment insurance or unemployment assistance. In general, if unemployment insurance and unemployment assistance benefits are wage-dependent, 'xi1' and 'brepl' are determined by the overall eligibility rate and the overall replacement rate. If unemployment insurance and unemployment assistance are both independent of previous labour income then 'b00'[46] is set equal to the product of overall eligibility and overall replacement rate. In the following countries, in which unemployment insurance is wage-dependent but unemployment assistance is not, the calibration of 'xi1', 'brepl' and 'b00' is a little bit more complicated and described below.

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[46] In this case and in following subsections 'b00' refer to benefits from the unemployment system. 'b00' also includes benefits from income maintenance programs, which is not discussed here. In the 'DataInputXX.xls' file, 'b00' is equal to the sum of 'b00' (unemployment) and 'b00' (income maintenance) and 'b00' (sickness benefits).

Germany

Unemployment benefits in Germany consist of unemployment insurance benefits and fixed unemployment assistance (Arbeitslosengeld II) benefits. To determine 'xi1', 'brepl' and 'b00' we start by deriving 'brepl'. The unemployment insurance replacement rate amounts to 60 percent in case of no dependent children and 67 percent otherwise. We use information about unemployed persons receiving unemployment payments and combine it with the information whether children live in the household or not.[47] Both necessary variables are available in the LFS. Combining this information with the two replacement rates of 60 and 67 percent determines 'brepl'. The next step is to derive 'xi1'. First, we determine the share of persons receiving unemployment insurance benefits on all persons receiving benefits by using information of the Bundesagentur für Arbeit[48]. The publications contain information about the age- and skill-structure of the division between persons eligible for unemployment insurance benefits and Arbeitslosengeld II but no combined age-skill-structure. Therefore we combine these two tables by assuming that the share according to education is the same as the aggregate share in all age-groups. 'xi1' is determined by multiplying these shares by the overall eligibility rate in the corresponding age- and skill-group. The last step is to derive 'b00'. Bundesagentur (2009) contains information about the legal system, the structure of households receiving payments as well as the number of individuals supported in the household and the number of households. This information allows to approximate individual payments. Relating these values to average labour income provides average replacement rates for persons receiving unemployment assistance benefits.

Finland

The Finnish unemployment system is rather complicated. Unemployment benefits consist of a basic benefit and an earnings related part for previous labour income above a threshold. The basic benefit is the same as the Labour Market Subsidy, which is the unemployment assistance benefit. Official Statistics of Finland (2010) provides information about the share of unemployed persons receiving either earnings related benefits, or the basic unemployment allowance or the Labour Market Subsidy for different age groups and different occupations. As the shares are very similar across the different occupations we assume a fixed share across the skill-groups as approximation. 'xi1' is set equal to the share of unemployed persons receiving earnings-related unemployment benefits (derived as the share of unemployed persons receiving unemployment benefits times the share of these persons receiving earnings-related insurance benefits). In addition, we use income information of the EU-SILC to derive the share of income above the thresholds and multiply this share by the corresponding replacement rate which gives 'brepl'. The last step is to derive 'b00' which is determined by the information about the average replacement rate and

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[47] This method requires the assumption that the share of unemployed persons with children living in the household is the same for persons receiving unemployment insurance benefits and Arbeitlosengeld II.
[48] Bundesagentur für Arbeit (2006-2010).

eligibility across all unemployed persons. The derivation shows that 'b00' increases significantly with age (for the first two skill groups), which is the result of a strong increase of the share of persons receiving earnings-related benefits across the age groups and the fact that we include the basic benefit (benefit for income below the first threshold) of persons receiving earnings related benefits in 'b00' as this part of the benefit is independent of earnings.

France

In France, unemployment benefits are based on previous labour income while unemployment assistance benefits are wage-independent. They amount to EUR 14.51 per day or EUR 435.3 per month (2007). Together with average labour income, this allows to calculate a replacement rate for unemployment assistance benefits. To distinguish between persons receiving unemployment insurance (reflected in 'xi1' in this case) and unemployment assistance benefits or no benefits (1-'xi1') we use the LFS variables 'seekdur' and 'register' (equal to one or three) and assign persons being unemployed for less than one year and receiving benefits to the group of persons receiving unemployment insurance and persons being unemployed for more than one year and receiving benefits to the group of persons receiving unemployment assistance. The replacement rate in the unemployment assistance system together with the share of unemployed persons (of all persons receiving benefits) receiving unemployment assistance and the overall replacement rate allow to determine 'brepl'. 'xi1' is derived by multiplying the share of persons receiving unemployment insurance (of all unemployed persons receiving benefits) by the overall eligibility rate for each age- and skill-group. Given the overall replacement rate, 'b00' can be derived easily.

Spain

The calculation of 'xi1', 'brepl' and 'b00' is very similar to the method we used in France. First, we received data from the Spanish Ministry of Labour about the age structure of the share of unemployed persons receiving unemployment insurance or unemployment assistance. No information is available for the different skill-groups. Using information of LFS about the duration of searching for a new job the data show that this duration is rather similar across the skill-groups such that we use the same division of persons receiving unemployment insurance or assistance for all skill-groups. Given the amount of unemployment assistance,[49] it is possible to calculate a replacement rate in the unemployment assistance system, given average gross labour income for the different age- and skill-groups. 'xi1' is determined by multiplying the share of persons receiving unemployment insurance of all persons receiving unemployment benefits by the overall eligibility rate. 'b00' is derived by multiplying overall eligibility by the share of persons

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[49] 80 percent of IPREM or EUR 413.52 (2008) for persons aged below 45 and higher benefits for older unemployed persons, depending on the number of relatives supported.

receiving unemployment assistance of all persons receiving unemployment benefits as well as by the unemployment assistance replacement rate and dividing by the share of unemployed persons who do not receive unemployment insurance benefits (1-'xi1'). For the calculation of 'ba0', the latter term cancels as 'b00' is multiplied by (1-'xi1'). The other terms reflect the share of persons on all unemployed persons receiving unemployment assistance.

Sweden

In Sweden, unemployment insurance is income-related and unemployment assistance benefits are defined as fixed, wage-independent, benefits. For this reason it is necessary to split replacement income into a wage-dependent component, reflected in 'xi1' and 'brepl', and a wage-independent component, reflected in 'b00'. The calculations are performed in the file 'Seekdurse.xlsx'. We assume that persons being unemployed for more than one year (long-term unemployed) receive wage-independent unemployment assistance. The share of persons being short-term unemployed is derived by using the LFS variable 'seekdur' and takes only into account unemployed persons who are registered at the public unemployment office and receive unemployment benefits or unemployment assistance ('register' is equal to one or three). Multiplying by overall eligibility across all unemployed persons, gives 'xi1'. Unemployment assistance amounts to 6,933.3 SEK per month (320 SEK per day, 21.3 days per month) for a person having worked full-time[50] before unemployment. For persons who have worked less, unemployment assistance benefits are decreased proportionally. We use information in EU-SILC about the number of hours usually worked and scale the unemployment assistance benefit accordingly and relate it to the average income of each age- and skill-group providing a measure for the average replacement rate in the unemployment assistance system. Given the share of persons receiving unemployment assistance, the average replacement rate in the unemployment assistance as well as the overall unemployment replacement rate allows to determine the replacement rate in the unemployment insurance system, 'brepl'.

5.3.3.   Manipulation of the LFS Data

This subsection is concerned with necessary data corrections that we applied for the LFS data. In the model, individuals are 'born' into the skill group they will finally be part of after having finished education. This means, for example, that a 20-year-old student who has at that point of time only attained upper secondary education but will receive a tertiary degree is already assigned to the group of high-skilled individuals in the model. It is assumed that this student does not yet participate on the labour market. To account for this we remove persons

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[50] We assume that full-time corresponds to 40 hours of work per week.

currently undergoing educational activities (LFS variable: educstat = 1 or 3) from the lower skill levels when we derive labour market relevant variables from the official statistics.[51]

In line with that, for the calculation of the unemployment rate for 15-19 year old low-skilled workers, all persons still undergoing education are removed from the active population. Our calculation shows an unemployment rate for young low-skilled individuals that is much higher than we would expect. An important reason for this result might be that many low-skilled persons are searching for an apprenticeship training position. In the data, these individuals are low-skilled and unemployed. However, they will get an apprenticeship degree (and thus become medium-skilled) in the future.[52] Furthermore, after removing people still undergoing formal education, we are left with a very high share of persons with only a basic education who are not even trying to invest in additional education. This causes a strong upward bias of the unemployment rate for our calculations. We have solved this problem by replacing the unemployment rate for the low-skilled aged 15-19 years with the one of the low-skilled aged 20-24, since this value seems to be the best approximation for an 'economic' unemployment rate.

Until 2007, the Office of National Statistics doesn't observe the highest ISCED level attained for those persons that have already retired from active work in the LFS data-set for the UK. The large inactive, mostly already retired, part of the workforce would not enter the numerator for the calculation of the participation rate for a particular skill group (those individuals are eliminated from the calculation as we have no information on their skill level). This would result in a strong upward bias of the participation rate for the three groups of workers older than 55 if we simply apply our standard method of calculating participation rates. We correct for this problem by applying the skill distribution of the 55-59 years old individuals to the whole age group of 55-69 years olds. The former is known to us since the standard retirement age for women in the UK is 60 years and thus our skill distribution is not distorted yet for this age group. The result should be a good proxy for the participation rate of the age group 55-69 as required in the model.

5.3.4. Revenue Statistics

This chapter provides information on adjustment to data from the Revenue Statistics that is necessary because the labour market model includes items (such as occupational pension

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[51] As a simple example, assume one person aged 16 is participating on the labour market and another person is still at school. In this case, the Eurostat database would publish a participation rate of 50 percent for low-skilled individuals aged 15-19. In our model, the former individual would be low-skilled and participate on the labour market (participation rate is equal 1), while the other individual is medium-skilled, but does not yet participate on the labour market.

[52] Again, this can be illustrated by a simple example. Assume that a 16-year-old individual has a low-skilled job. Another 16-year-old individual is searching for an apprenticeship-job in order to attain an upper-secondary education. In the Eurostat data, both are counted as being low-skilled and the unemployment rate of young low-skilled would be 50 percent.

schemes) that are not included in the Revenue Statistics or because contributions are classified differently in the model and the Revenue Statistics. In many cases, OECD staff or national experts supported us by providing necessary data.

Denmark

Contributions to the occupational pension schemes agreed between the social partners are not included in the Revenue Statistics. According to Vidlund (2009), contributions to these schemes amount to 5.25 % of GDP in 2005 and this amount is included in the item 'Social Security' in the labour market model.

In contrast to other countries, there are fixed social security contributions (unemployment, supplementary pension) in Denmark, which are included in the variables 'zw', 'zu' and 'zf' and which are also taken into account in calculating revenues in the model. However, the variables 'zw' and 'zu' also include sickness benefits, which makes it difficult to distinguish these flat social security contributions and sickness benefits in the model. Therefore, we diminish social security revenues by the expenditures for sickness benefits (which are taken from the Social Expenditures database of the OECD).

France

Occupational pension schemes (such as the ARRCO scheme for the majority of private-sector employees) are not included in the Revenue Statistics. According to Bach-Othman (2009), premia income from these scheme amounts to 58 billion Euro in 2005. Revenues from 'Social Security' in the model are increased by an appropriate amount.

Germany

Contributions of individuals who have opted out of the public health insurance system into a private system are not included in the Revenue Statistics. Revenues from the item 'Social Security' are increased by numbers derived from the 'Gesundheitsberichterstattung des Bundes ' (Federal Health Monitoring).

Netherlands

Occupational pension schemes are not included in the Revenue Statistics. Based on information from the OECD Global Pension Statistic, revenues from 'Social Security' in the model are increased by an appropriate amount.

Poland

Revenues from the National Health Fund are included under item 2000: 'Social Security' Contributions' in the Revenue Statistics. Given that this contribution is part of the income tax rate in the labour market model, revenues from this Fund have to be redirected from the item 'Social Security' to 'Income' for the calibration of the model.

Category 2000 ('Social Security') of the Revenue Statistics does not include contributions to the defined contribution scheme ('Open Pension Funds'). Revenues from 'Social Security' in the model are increased by an appropriate amount. Data for both adjustments (National Health Fund and the defined contribution scheme) have been provided by OECD staff.

Slovak Republic

Category 2000 ('Social Security') of the Revenue Statistics does not include contributions to the defined contribution scheme. Data on these contributions have been provided by OECD staff directly. Revenues from 'Social Security' in the model are increased by an appropriate amount.

Sweden

Category 2000 ('Social Security') of the Revenue Statistics does not include contributions to the occupational pension schemes. Data on these contributions have been provided by our national expert for Sweden on the basis of year books of the companies. Revenues from 'Social Security' in the model are increased by an appropriate amount.

United Kingdom

Category 2000 ('Social Security') of the Revenue Statistics does not include contributions of those individuals who have contracted out of the state second pension. Data on these contributions can be found in the separate chapter 'Financing Social Benefits' in the Revenue Statistics 2009. Revenues from 'Social Security' in the model are increased by an appropriate amount.

5.3.5. Income Taxation and Social Security Contributions

This chapter provides information on the implementation of specific institutional details in the labour market model.

Belgium

We take into account the non-earning spouse allowance (meaning that a notional amount of income can be transferred between spouses under certain conditions) in the calibration of the tax rates. This allowance is explicitly considered in the Stata-File, but this procedure also involves a different way of deriving the parameter-file TaxBelgium.xlsx.[53]

Czech Republic

The assessment base for income taxation is gross earnings augmented with employer's social security contributions, a possibility that is not implemented in the labour market model. Our approach here is to implement

$$xtax = -\frac{tf}{ts} => \ taxable\ income = (1 - xtax * ts) * incgross = (1 + tf) * incgross,$$

where 'tf' and 'ts' are the employer's and the employee's contribution rate. In that way, we can assure that taxable income is calculated in the right way.[54]

Denmark

Whereas the social security contribution (eight percent contribution rate) is part of the social security contributions in the Tax-Benefit model, it is included as an Income Tax in the Revenue Statistics. We follow the Tax-Benefit model and categorise it as a social security contribution (i.e. we include the revenues in the chapter 2000).

In contrast to Taxing Wages, the administrative charge to the unemployment fund is included in the Tax-Benefit model. We follow this approach.

The flat social security contributions of employees are deductible from taxable income but a flat, deductible contribution is not included in the model. Thus, we calculate a 'net flat' contribution of '(1-tw)*flat', which is reflected in 'zw' and 'zu' in the model. Furthermore, we

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[53] For instance, application of the Tax-Benefit model of the OECD for a couple with one earner would take into account the spouse allowance in the parameter file. As we consider the allowance on our own in the Stata-File, we do not want this reduction of the income tax rate to be included in the parameter file TaxBelgium, so that we replicate 'Single' files also for the '1Earner' and the 'Principal' sheets.

[54] The alternative would have been to implement a separate term in the equations in the model, which would have made the model more complex.

calculate an assessment base for the income tax rate which includes the flat contribution, both in our calibration of the tax rates (TaxDenmark-file) and in the LMM. This approximation should replicate the reality in sufficient detail.

Following the above issue of including flat social security contributions in the variables 'zw', 'zu' and 'zf', revenues from social security contributions in the LMM must therefore also include the values 'zw', 'zu' and 'zf' (reflected in the variable 'expenz'). However, as the variables 'zw' and 'zu' also include sickness benefits, we reduce revenues from social security contributions by aggregate expenditures for sickness benefits.

As we take into account occupational pension plans in the labour market model, which are not considered in the Tax-Benefit model of the OECD, we increase the employer's contribution rate by 10.8 percentage points (in the TaxDenmark-file), which is the average contribution rate according to 'Pensions at a Glance'.

Finland

The earned income tax credit is implicitly taken into account in the average tax rate.

The different treatment of employees' social security contributions is taken into account in the LMM. We assume, however, that both types of contributions are based on gross income (this issue is corrected via contribution rates which are lower than the statutory rates) and the variable 'xtax' is lower than one to reflect that health insurance is not deductible for income taxation.

For employees aged 53 or older, the pension insurance contribution increases from 4.3 percent to 5.2 percent. This is taken into account in the Stata-File.

Pensions are subject to taxation in Finland but there are special deductions so that low pensions are not taxed. Given that the Tax-Benefit model does not include the taxation of pension benefits, we try to replicate an income tax rate for retirees on our own in the TaxFinland file. The information for this replication is based on the MISSOC database.

France

Employers' contributions in the TaxBenefit model include 'other' contributions such as the supplemental pension and the AGFF contribution and also take into account a reduction of employer-paid social insurance contributions. The supplemental pension is also taken into account in our modelling of the pension system. However, although actual contributions to this system are higher, benefits are only earned on 6 percent resp. 16 percent of earnings (see Section 2.12).

CSG and CRDS are part of the income tax in the Tax-Benefit model and in the Revenue Statistics. The assessment base of the CSG and the CRDS is 97% of gross pay and CSG is partly deductible against taxable income. We also categorise these two contributions as income tax, but we also assume that these contributions have the same assessment base as the income tax (although they actually have 0.97*gross pay as assessment base). However, as we make this assumption both in the TaxFrance-file and in the labour market model, this method should be fine. Compulsory employer and employee payroll are deductible for income taxation, except for CSG and CRDS contributions. As the latter two are part of our income tax rate anyway, we can set 'xtax'=1.

The PPE and the tax credit for low earning households are implicitly included in the average tax rate.

Local Taxes are not included in the Tax-Benefit model of the OECD, because 'they vary widely'. As long as they are considered in the Revenue Statistics, they are included in the aggregate revenues of the labour market model, such that tax rates are scaled appropriately in the calibration routine of LMM.

Netherlands

According to Taxing Wages, the employer contribution does not include the employers' contribution to medical care.

In the Tax-Benefit model, the employers' contribution does include a health insurance contribution that is actually described in the chapter 'employees' contributions' of Taxing Wages.

The Tax-Benefit model includes the employee's pension premium to occupational pensions, which is described in the NTCP part of Taxing Wages (there is also an old-age pension contribution of 17.9 percent of taxable income). In contrast to that, employers' contributions are not considered in the Tax-Benefit model. We take them into account in the TaxNetherlands file on our own.

We follow the approach of the OECD to include basic health insurance and the care benefit in the model. We model the basic insurance as an earnings-dependent contribution. Even though it is a flat contribution, the care benefit compensates individuals with lower income for the contribution (the benefit declines with higher income), so that the contribution can be seen as being earnings-dependent for simplicity.

Poland

The contribution to the National Health Fund is included as an income tax in the labour market model. Basically, this has the advantage that we do not have to do a complex derivation of 'xtax' as a major part of the contribution to the NHF can be deducted as a tax credit for income taxation.

Social security contributions include the pension contributions also for those individuals who contribute to the defined contribution scheme, see chapter 5.3.4.

Slovak Republic

Given that the Tax-Benefit model excludes 9 percentage points of the employers' contribution rate because of the possibility of contracting out into private pension funds, we include these funds in our model by increasing the contribution rate (from 26.2 to 35.2 percent).

Sweden

The EITC is implicitly taken into account via lower income tax rates. Furthermore, a tax credit equal to 100 percent of compulsory employee's social security contributions is granted. According to the Tax-Benefit model of the OECD, the assessment base for income taxation in the model is equal to gross labour income, so that we set 'xtax' equal to zero in the LMM. This issue is, however, somehow tricky to implement in case of policy reforms. In general, we change the amount of the tax credit if the employees' rate changes because of a policy reform.[55]

A reduced employers' social security contribution is applied for individuals aged under 26. We calculate the rates as if there was no reduction and then reduce the resulting rates in the DataInputSweden file.

Occupational pensions are included in the model by using information from Pensions at a Glance. For simplicity, we assume that 90 percent of all employees are covered by the ITP scheme, which has a contribution rate of 4.5 percent below SEK 360,000 and 30 percent above this threshold.

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[55] Assume, for example, a necessary increase of the employee rate in order to finance higher social expenditures. As we apply the institutional setting, this implies a one-for-one decrease of income tax revenues (as the tax credit increases in line with the increase of the employee's rate).

Spain

The Tax-Benefit model does not take into account the lower ceiling for social security contributions. Thus, we manually set the contribution rate to zero in the TaxSpain-file for low-income earners.

As a general rule, individuals are taxed separately in Spain, but families also have the option of being taxed as married couples or as heads of households. The Tax-Benefit model calculates tax liabilities on the basis of these different options and assumes that households opt for the more beneficial situation. Thus, this system is also taken into account when calibrating the tax rates in the labour market model.

United Kingdom

We include those individuals who have contracted out of the state second pension as if they had not contracted out, see 5.3.1 and 5.3.4. Therefore we also do not have to control for the option of contracting out in our calculation of social security contributions.

5.3.6. Concepts of Productivity in the LMM

As described in chapter 4.4.4 (and Berger et al. (2009) in more detail), 'individual labour productivity' is defined as

$$\theta = \theta^F * \theta^H,$$

i.e. it is the product of productivity resulting from firm-sponsored training, θ^F, and productivity of households, θ^H. This implies that our definition of 'individual labour productivity' (and the change of 'individual labour productivity' as derived in the Excel output files) does not include the marginal product of labour, F_L, which is the derivative of the production function and, simply speaking, translates individual productivity into productivity within the production process.

The change of 'labour productivity' as presented in the output file (generated by writemodel(compstat)) includes both elements, i.e. the change of the marginal product of labour, F_L, and the change of 'individual labour productivity', θ.[56]

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[56] Notice that 'individual productivity' is also included in 'effective employment', which is the result of i) the number of workers, ii) average number of hours worked per worker, and iii) 'individual productivity'.

5.3.7.   **Evolvement of Foreign Debt Towards Long-run Equilibrium**

Given that both demand and supply of goods in a country are determined endogenously in LMM, the current account is therefore also determined endogenously in each period as well. For this reason, foreign debt evolves endogenously over time. The following mechanism ensures that the foreign debt to GDP ratio converges in the long-run:

As described in Berger et al. (2009), assets of private households are comprised of government debt, the firm value and net foreign assets. If, for example, a country's current account worsens over several periods, net foreign assets decline. As a result, assets of private households are reduced, which implies a reduction of private consumption. Therefore, demand for goods declines, which improves the current account again. This mechanism ensures that the foreign debt to GDP ratio converges in the long-run.

5.4. Dynamic Impact of Income Tax Reform, Tables

Table 35: Dynamic Impact of Income Tax Reform, Denmark

Income Tax Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	-0.24%	-0.27%	-0.29%	-0.31%	-0.33%	-0.39%	-0.45%	-0.48%	-0.51%	-0.53%	-0.54%
Investment	-0.78%	-0.73%	-0.69%	-0.66%	-0.63%	-0.54%	-0.49%	-0.49%	-0.50%	-0.50%	-0.51%
Consumption	-1.04%	-1.06%	-1.07%	-1.08%	-1.09%	-1.14%	-1.22%	-1.27%	-1.34%	-1.41%	-1.43%
Trade Balance (change in % of gdp)	0.03%	0.01%	0.00%	-0.01%	-0.01%	-0.03%	-0.03%	-0.02%	-0.01%	0.01%	0.02%
Gross wage rate (labour costs per hour)	0.32%	0.28%	0.25%	0.22%	0.19%	0.11%	0.05%	0.04%	0.03%	0.02%	0.02%
-low	0.14%	0.12%	0.10%	0.08%	0.07%	0.02%	-0.05%	-0.08%	-0.11%	-0.11%	-0.14%
-medium	0.21%	0.19%	0.17%	0.15%	0.13%	0.07%	0.01%	-0.02%	-0.03%	-0.03%	-0.02%
-high	0.50%	0.44%	0.38%	0.34%	0.30%	0.19%	0.15%	0.17%	0.19%	0.17%	0.17%
Net wage rate	-1.04%	-1.08%	-1.11%	-1.14%	-1.17%	-1.25%	-1.31%	-1.32%	-1.33%	-1.33%	-1.34%
-low	-0.96%	-0.98%	-0.99%	-1.01%	-1.02%	-1.07%	-1.14%	-1.17%	-1.20%	-1.21%	-1.23%
-medium	-1.05%	-1.08%	-1.10%	-1.12%	-1.14%	-1.20%	-1.25%	-1.28%	-1.29%	-1.29%	-1.29%
-high	-1.04%	-1.10%	-1.15%	-1.20%	-1.24%	-1.35%	-1.38%	-1.36%	-1.35%	-1.37%	-1.36%
Average number of hours worked per worker	-0.08%	-0.09%	-0.09%	-0.09%	-0.10%	-0.10%	-0.11%	-0.11%	-0.11%	-0.11%	-0.11%
Participation rate - 15-69 yrs. (change in pp)	-0.09	-0.09	-0.09	-0.09	-0.09	-0.10	-0.10	-0.11	-0.12	-0.12	-0.12
-low	-0.12	-0.12	-0.12	-0.12	-0.12	-0.13	-0.13	-0.14	-0.15	-0.16	-0.16
-medium	-0.10	-0.11	-0.11	-0.11	-0.12	-0.12	-0.12	-0.13	-0.13	-0.13	-0.13
-high	-0.06	-0.05	-0.05	-0.05	-0.05	-0.04	-0.06	-0.07	-0.08	-0.08	-0.08
Employment (no. of workers)	-0.21%	-0.22%	-0.23%	-0.23%	-0.24%	-0.26%	-0.29%	-0.30%	-0.32%	-0.32%	-0.32%
-low	-0.28%	-0.27%	-0.27%	-0.27%	-0.26%	-0.25%	-0.20%	-0.17%	-0.15%	-0.15%	-0.12%
-medium	-0.22%	-0.23%	-0.24%	-0.25%	-0.25%	-0.27%	-0.29%	-0.30%	-0.32%	-0.33%	-0.34%
-high	-0.14%	-0.16%	-0.18%	-0.19%	-0.21%	-0.26%	-0.34%	-0.39%	-0.42%	-0.41%	-0.43%
Unemployment rate (change in pp)	0.07	0.08	0.09	0.09	0.10	0.12	0.13	0.14	0.14	0.14	0.14
-low	0.09	0.10	0.10	0.11	0.11	0.13	0.15	0.16	0.17	0.17	0.18
-medium	0.07	0.08	0.09	0.09	0.10	0.11	0.13	0.13	0.14	0.14	0.13
-high	0.06	0.07	0.08	0.09	0.10	0.13	0.13	0.13	0.13	0.13	0.13
new persons - low	0.00%	0.59%	0.53%	0.48%	0.45%	0.39%	0.33%	0.29%	0.26%	0.26%	0.31%
new persons - medium	0.00%	0.07%	0.09%	0.08%	0.08%	0.03%	0.00%	-0.01%	-0.01%	-0.01%	-0.03%
new persons - high	0.00%	-0.50%	-0.47%	-0.44%	-0.41%	-0.31%	-0.23%	-0.19%	-0.17%	-0.17%	-0.18%
Revenue Share	65.97%	63.12%	60.64%	58.47%	56.58%	50.04%	44.18%	41.64%	39.43%	38.62%	38.05%

Table 36: Dynamic Impact of Income Tax Reform, Germany

Income Tax Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	-0.22%	-0.26%	-0.29%	-0.31%	-0.32%	-0.38%	-0.43%	-0.47%	-0.51%	-0.52%	-0.53%
Investment	-1.05%	-0.96%	-0.88%	-0.81%	-0.76%	-0.61%	-0.56%	-0.57%	-0.58%	-0.57%	-0.57%
Consumption	-0.83%	-0.86%	-0.87%	-0.89%	-0.90%	-0.95%	-1.03%	-1.07%	-1.12%	-1.15%	-1.16%
Trade Balance (change in % of gdp)	0.07%	0.08%	0.06%	0.04%	0.03%	-0.01%	-0.02%	-0.02%	-0.03%	-0.03%	-0.03%
Gross wage rate (labour costs per hour)	0.40%	0.37%	0.33%	0.29%	0.26%	0.16%	0.10%	0.09%	0.07%	0.06%	0.06%
-low	0.09%	0.08%	0.07%	0.05%	0.04%	0.00%	-0.06%	-0.09%	-0.13%	-0.15%	-0.15%
-medium	0.25%	0.24%	0.21%	0.19%	0.16%	0.08%	-0.03%	-0.09%	-0.14%	-0.14%	-0.14%
-high	0.68%	0.63%	0.56%	0.51%	0.46%	0.35%	0.38%	0.47%	0.53%	0.50%	0.50%
Net wage rate	-0.86%	-0.88%	-0.92%	-0.95%	-0.98%	-1.08%	-1.14%	-1.16%	-1.17%	-1.18%	-1.18%
-low	-0.60%	-0.60%	-0.61%	-0.63%	-0.64%	-0.68%	-0.73%	-0.77%	-0.81%	-0.83%	-0.83%
-medium	-0.82%	-0.84%	-0.86%	-0.89%	-0.91%	-0.99%	-1.10%	-1.16%	-1.21%	-1.21%	-1.21%
-high	-0.99%	-1.04%	-1.11%	-1.16%	-1.21%	-1.32%	-1.29%	-1.20%	-1.14%	-1.17%	-1.17%
Average number of hours worked per worker	-0.05%	-0.06%	-0.06%	-0.06%	-0.07%	-0.07%	-0.08%	-0.09%	-0.09%	-0.09%	-0.09%
Participation rate - 15-69 yrs. (change in pp)	-0.08	-0.09	-0.10	-0.10	-0.10	-0.10	-0.10	-0.11	-0.12	-0.12	-0.12
-low	-0.07	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.09	-0.09	-0.10	-0.10
-medium	-0.10	-0.11	-0.12	-0.12	-0.12	-0.13	-0.13	-0.13	-0.14	-0.15	-0.15
-high	-0.06	-0.06	-0.06	-0.06	-0.05	-0.04	-0.06	-0.08	-0.09	-0.08	-0.08
Employment (no. of workers)	-0.20%	-0.22%	-0.23%	-0.24%	-0.24%	-0.26%	-0.28%	-0.30%	-0.32%	-0.32%	-0.32%
-low	-0.19%	-0.21%	-0.21%	-0.22%	-0.22%	-0.21%	-0.19%	-0.17%	-0.14%	-0.12%	-0.12%
-medium	-0.22%	-0.24%	-0.25%	-0.25%	-0.25%	-0.25%	-0.23%	-0.23%	-0.23%	-0.25%	-0.25%
-high	-0.17%	-0.19%	-0.21%	-0.22%	-0.23%	-0.29%	-0.41%	-0.50%	-0.57%	-0.55%	-0.55%
Unemployment rate (change in pp)	0.06	0.07	0.08	0.08	0.08	0.10	0.11	0.11	0.12	0.12	0.12
-low	0.06	0.06	0.07	0.07	0.07	0.08	0.09	0.10	0.10	0.11	0.11
-medium	0.07	0.07	0.08	0.08	0.08	0.09	0.11	0.11	0.12	0.12	0.12
-high	0.07	0.08	0.08	0.09	0.10	0.11	0.11	0.10	0.09	0.09	0.09
new persons - low	0.00%	0.16%	0.16%	0.17%	0.17%	0.17%	0.18%	0.19%	0.19%	0.18%	0.19%
new persons - medium	0.00%	0.30%	0.29%	0.28%	0.27%	0.23%	0.16%	0.13%	0.10%	0.10%	0.10%
new persons - high	0.00%	-0.76%	-0.74%	-0.72%	-0.70%	-0.60%	-0.46%	-0.39%	-0.33%	-0.33%	-0.34%
Revenue Share	74.76%	65.30%	64.03%	63.27%	62.64%	60.55%	58.50%	57.49%	56.93%	57.53%	57.47%

Table 37: Dynamic Impact of Income Tax Reform, Italy

Income Tax Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	-0.35%	-0.37%	-0.40%	-0.42%	-0.43%	-0.50%	-0.58%	-0.62%	-0.67%	-0.69%	-0.70%
Investment	-0.90%	-0.87%	-0.84%	-0.82%	-0.80%	-0.74%	-0.72%	-0.73%	-0.75%	-0.76%	-0.77%
Consumption	-1.26%	-1.27%	-1.27%	-1.28%	-1.28%	-1.29%	-1.30%	-1.29%	-1.27%	-1.25%	-1.26%
Trade Balance (change in % of gdp)	0.24%	0.22%	0.20%	0.18%	0.17%	0.11%	0.03%	-0.01%	-0.07%	-0.12%	-0.12%
Gross wage rate (labour costs per hour)	0.34%	0.31%	0.29%	0.27%	0.25%	0.18%	0.12%	0.11%	0.09%	0.07%	0.07%
-low	0.15%	0.13%	0.12%	0.11%	0.09%	0.04%	-0.04%	-0.09%	-0.14%	-0.15%	-0.15%
-medium	0.33%	0.31%	0.28%	0.27%	0.25%	0.18%	0.11%	0.08%	0.07%	0.07%	0.07%
-high	0.60%	0.56%	0.52%	0.49%	0.46%	0.41%	0.48%	0.59%	0.65%	0.57%	0.57%
Net wage rate	-0.78%	-0.80%	-0.82%	-0.84%	-0.86%	-0.93%	-0.98%	-1.00%	-1.01%	-1.03%	-1.03%
-low	-0.60%	-0.62%	-0.63%	-0.65%	-0.66%	-0.71%	-0.79%	-0.84%	-0.89%	-0.90%	-0.90%
-medium	-0.80%	-0.82%	-0.84%	-0.86%	-0.88%	-0.95%	-1.02%	-1.04%	-1.06%	-1.05%	-1.06%
-high	-1.04%	-1.08%	-1.12%	-1.15%	-1.18%	-1.23%	-1.16%	-1.06%	-0.99%	-1.07%	-1.07%
Average number of hours worked per worker	-0.06%	-0.06%	-0.06%	-0.07%	-0.07%	-0.07%	-0.08%	-0.08%	-0.08%	-0.08%	-0.08%
Participation rate - 15-69 yrs. (change in pp)	-0.16	-0.16	-0.16	-0.17	-0.17	-0.18	-0.19	-0.21	-0.22	-0.22	-0.23
-low	-0.15	-0.15	-0.16	-0.16	-0.16	-0.17	-0.18	-0.19	-0.21	-0.22	-0.22
-medium	-0.18	-0.19	-0.19	-0.20	-0.20	-0.21	-0.23	-0.23	-0.24	-0.23	-0.23
-high	-0.14	-0.12	-0.11	-0.10	-0.09	-0.08	-0.11	-0.14	-0.15	-0.14	-0.14
Employment (no. of workers)	-0.34%	-0.35%	-0.36%	-0.36%	-0.37%	-0.39%	-0.43%	-0.46%	-0.49%	-0.50%	-0.50%
-low	-0.35%	-0.35%	-0.35%	-0.36%	-0.36%	-0.35%	-0.33%	-0.30%	-0.27%	-0.28%	-0.27%
-medium	-0.35%	-0.36%	-0.37%	-0.38%	-0.39%	-0.41%	-0.45%	-0.49%	-0.55%	-0.58%	-0.58%
-high	-0.28%	-0.30%	-0.31%	-0.33%	-0.34%	-0.43%	-0.63%	-0.77%	-0.86%	-0.82%	-0.83%
Unemployment rate (change in pp)	0.07	0.07	0.07	0.08	0.08	0.09	0.10	0.10	0.11	0.11	0.11
-low	0.07	0.07	0.08	0.08	0.08	0.09	0.11	0.11	0.12	0.12	0.12
-medium	0.06	0.07	0.07	0.07	0.07	0.08	0.09	0.09	0.10	0.10	0.10
-high	0.07	0.07	0.08	0.08	0.09	0.09	0.08	0.08	0.07	0.07	0.07
new persons - low	0.00%	0.34%	0.34%	0.34%	0.34%	0.33%	0.31%	0.29%	0.27%	0.26%	0.27%
new persons - medium	0.00%	0.22%	0.18%	0.13%	0.09%	-0.03%	-0.09%	-0.11%	-0.12%	-0.11%	-0.11%
new persons - high	0.00%	-1.68%	-1.55%	-1.42%	-1.31%	-0.97%	-0.74%	-0.61%	-0.51%	-0.52%	-0.53%
Revenue Share	58.23%	56.83%	55.61%	54.55%	53.64%	50.68%	49.10%	49.57%	51.32%	53.97%	54.42%

Table 38: Dynamic Impact of Income Tax Reform, Austria

Income Tax Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	-0.24%	-0.27%	-0.29%	-0.31%	-0.32%	-0.38%	-0.45%	-0.48%	-0.52%	-0.53%	-0.53%
Investment	-0.79%	-0.75%	-0.71%	-0.68%	-0.65%	-0.58%	-0.55%	-0.56%	-0.58%	-0.57%	-0.57%
Consumption	-0.98%	-0.99%	-1.00%	-1.01%	-1.02%	-1.05%	-1.08%	-1.10%	-1.11%	-1.12%	-1.12%
Trade Balance (change in % of gdp)	0.12%	0.11%	0.09%	0.08%	0.07%	0.03%	0.00%	-0.02%	-0.04%	-0.06%	-0.06%
Gross wage rate (labour costs per hour)	0.38%	0.34%	0.31%	0.28%	0.26%	0.17%	0.11%	0.09%	0.07%	0.06%	0.06%
-low	0.11%	0.09%	0.08%	0.06%	0.05%	0.01%	-0.05%	-0.09%	-0.13%	-0.15%	-0.15%
-medium	0.29%	0.26%	0.24%	0.21%	0.19%	0.11%	0.02%	-0.03%	-0.07%	-0.07%	-0.07%
-high	0.70%	0.63%	0.57%	0.53%	0.48%	0.38%	0.44%	0.53%	0.60%	0.56%	0.56%
Net wage rate	-0.81%	-0.84%	-0.88%	-0.90%	-0.93%	-1.01%	-1.07%	-1.09%	-1.11%	-1.12%	-1.12%
-low	-0.51%	-0.52%	-0.54%	-0.55%	-0.56%	-0.60%	-0.66%	-0.70%	-0.74%	-0.76%	-0.76%
-medium	-0.80%	-0.82%	-0.85%	-0.87%	-0.89%	-0.97%	-1.06%	-1.11%	-1.15%	-1.15%	-1.15%
-high	-1.01%	-1.07%	-1.13%	-1.17%	-1.21%	-1.31%	-1.26%	-1.17%	-1.10%	-1.14%	-1.14%
Average number of hours worked per worker	-0.06%	-0.06%	-0.06%	-0.06%	-0.07%	-0.08%	-0.08%	-0.09%	-0.09%	-0.09%	-0.09%
Participation rate - 15-69 yrs. (change in pp)	-0.09	-0.10	-0.10	-0.10	-0.10	-0.11	-0.11	-0.12	-0.13	-0.13	-0.13
-low	-0.08	-0.08	-0.08	-0.08	-0.09	-0.09	-0.09	-0.10	-0.11	-0.12	-0.12
-medium	-0.10	-0.11	-0.12	-0.12	-0.12	-0.13	-0.14	-0.14	-0.15	-0.15	-0.15
-high	-0.07	-0.06	-0.06	-0.05	-0.05	-0.04	-0.06	-0.08	-0.09	-0.08	-0.08
Employment (no. of workers)	-0.22%	-0.23%	-0.24%	-0.25%	-0.25%	-0.27%	-0.29%	-0.31%	-0.33%	-0.33%	-0.33%
-low	-0.22%	-0.22%	-0.23%	-0.23%	-0.23%	-0.23%	-0.21%	-0.19%	-0.16%	-0.14%	-0.14%
-medium	-0.24%	-0.25%	-0.25%	-0.26%	-0.26%	-0.27%	-0.27%	-0.28%	-0.29%	-0.31%	-0.31%
-high	-0.18%	-0.19%	-0.20%	-0.22%	-0.23%	-0.29%	-0.43%	-0.52%	-0.59%	-0.57%	-0.57%
Unemployment rate (change in pp)	0.07	0.08	0.08	0.08	0.09	0.10	0.11	0.11	0.12	0.12	0.12
-low	0.08	0.08	0.08	0.09	0.09	0.10	0.11	0.12	0.13	0.13	0.13
-medium	0.07	0.08	0.08	0.08	0.09	0.10	0.11	0.12	0.12	0.12	0.12
-high	0.06	0.07	0.08	0.08	0.09	0.10	0.09	0.08	0.08	0.08	0.08
new persons - low	0.00%	0.20%	0.20%	0.20%	0.20%	0.21%	0.21%	0.21%	0.21%	0.20%	0.21%
new persons - medium	0.00%	0.22%	0.21%	0.20%	0.19%	0.14%	0.09%	0.06%	0.05%	0.05%	0.05%
new persons - high	0.00%	-0.90%	-0.87%	-0.84%	-0.80%	-0.65%	-0.49%	-0.41%	-0.36%	-0.36%	-0.36%
Revenue Share	73.21%	71.05%	69.16%	67.53%	66.11%	61.36%	57.79%	56.91%	57.15%	58.96%	59.19%

Table 39: Dynamic Impact of Income Tax Reform, Poland

Income Tax Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	-0.25%	-0.28%	-0.30%	-0.32%	-0.34%	-0.40%	-0.45%	-0.48%	-0.51%	-0.52%	-0.52%
Investment	-0.75%	-0.70%	-0.65%	-0.62%	-0.59%	-0.50%	-0.49%	-0.51%	-0.54%	-0.55%	-0.55%
Consumption	-1.05%	-1.06%	-1.07%	-1.08%	-1.09%	-1.10%	-1.10%	-1.09%	-1.07%	-1.05%	-1.06%
Trade Balance (change in % of gdp)	0.20%	0.18%	0.16%	0.14%	0.12%	0.07%	0.03%	-0.01%	-0.06%	-0.09%	-0.09%
Gross wage rate (labour costs per hour)	0.41%	0.37%	0.32%	0.29%	0.26%	0.16%	0.11%	0.09%	0.09%	0.08%	0.08%
-low	0.22%	0.21%	0.19%	0.18%	0.17%	0.14%	0.10%	0.07%	0.04%	0.03%	0.03%
-medium	0.30%	0.28%	0.25%	0.23%	0.21%	0.14%	0.06%	0.01%	-0.04%	-0.05%	-0.05%
-high	0.53%	0.45%	0.39%	0.33%	0.29%	0.17%	0.18%	0.25%	0.32%	0.31%	0.30%
Net wage rate	-0.55%	-0.59%	-0.63%	-0.67%	-0.70%	-0.79%	-0.84%	-0.85%	-0.86%	-0.87%	-0.87%
-low	-0.54%	-0.55%	-0.57%	-0.58%	-0.59%	-0.62%	-0.66%	-0.69%	-0.72%	-0.73%	-0.73%
-medium	-0.59%	-0.62%	-0.65%	-0.67%	-0.69%	-0.76%	-0.83%	-0.88%	-0.93%	-0.94%	-0.94%
-high	-0.56%	-0.63%	-0.70%	-0.75%	-0.80%	-0.92%	-0.90%	-0.83%	-0.76%	-0.78%	-0.78%
Average number of hours worked per worker	-0.05%	-0.05%	-0.06%	-0.06%	-0.06%	-0.07%	-0.07%	-0.07%	-0.07%	-0.07%	-0.07%
Participation rate - 15-69 yrs. (change in pp)	-0.11	-0.11	-0.12	-0.12	-0.13	-0.14	-0.15	-0.15	-0.16	-0.17	-0.17
-low	-0.14	-0.14	-0.15	-0.15	-0.15	-0.16	-0.17	-0.17	-0.18	-0.19	-0.19
-medium	-0.12	-0.12	-0.13	-0.14	-0.14	-0.15	-0.16	-0.17	-0.18	-0.19	-0.18
-high	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.08	-0.09	-0.09	-0.09	-0.09
Employment (no. of workers)	-0.24%	-0.25%	-0.26%	-0.28%	-0.29%	-0.31%	-0.34%	-0.36%	-0.39%	-0.39%	-0.39%
-low	-0.36%	-0.37%	-0.38%	-0.38%	-0.39%	-0.40%	-0.40%	-0.40%	-0.39%	-0.39%	-0.38%
-medium	-0.26%	-0.27%	-0.28%	-0.29%	-0.30%	-0.32%	-0.32%	-0.32%	-0.33%	-0.35%	-0.35%
-high	-0.13%	-0.15%	-0.17%	-0.19%	-0.20%	-0.27%	-0.38%	-0.45%	-0.52%	-0.52%	-0.51%
Unemployment rate (change in pp)	0.05	0.06	0.06	0.06	0.07	0.08	0.09	0.10	0.10	0.10	0.10
-low	0.07	0.08	0.08	0.08	0.08	0.09	0.10	0.10	0.11	0.11	0.11
-medium	0.06	0.06	0.07	0.07	0.07	0.08	0.09	0.10	0.11	0.11	0.11
-high	0.03	0.04	0.05	0.05	0.06	0.07	0.07	0.07	0.06	0.06	0.06
new persons - low	0.00%	0.09%	0.09%	0.10%	0.10%	0.10%	0.11%	0.11%	0.11%	0.11%	0.11%
new persons - medium	0.00%	0.15%	0.15%	0.15%	0.15%	0.14%	0.11%	0.10%	0.08%	0.08%	0.08%
new persons - high	0.00%	-0.54%	-0.54%	-0.53%	-0.53%	-0.49%	-0.42%	-0.37%	-0.32%	-0.32%	-0.32%
Revenue Share	71.54%	69.62%	68.02%	66.70%	65.62%	62.54%	61.55%	62.26%	64.16%	66.71%	67.07%

Table 40: Dynamic Impact of Income Tax Reform, United Kingdom

Income Tax Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	-0.24%	-0.27%	-0.30%	-0.32%	-0.33%	-0.39%	-0.45%	-0.48%	-0.51%	-0.52%	-0.52%
Investment	-0.90%	-0.83%	-0.77%	-0.72%	-0.68%	-0.57%	-0.55%	-0.56%	-0.57%	-0.57%	-0.58%
Consumption	-0.87%	-0.88%	-0.90%	-0.91%	-0.92%	-0.97%	-1.03%	-1.06%	-1.09%	-1.11%	-1.12%
Trade Balance (change in % of gdp)	0.09%	0.07%	0.05%	0.04%	0.02%	-0.01%	-0.02%	-0.02%	-0.02%	-0.03%	-0.02%
Gross wage rate (labour costs per hour)	0.37%	0.33%	0.29%	0.25%	0.23%	0.14%	0.09%	0.08%	0.07%	0.06%	0.06%
-low	0.13%	0.11%	0.10%	0.08%	0.07%	0.03%	-0.02%	-0.06%	-0.10%	-0.11%	-0.12%
-medium	0.26%	0.23%	0.21%	0.19%	0.17%	0.09%	0.00%	-0.04%	-0.07%	-0.06%	-0.06%
-high	0.55%	0.48%	0.43%	0.38%	0.34%	0.24%	0.25%	0.30%	0.33%	0.31%	0.31%
Net wage rate	-0.68%	-0.73%	-0.76%	-0.79%	-0.82%	-0.90%	-0.95%	-0.96%	-0.97%	-0.98%	-0.98%
-low	-0.59%	-0.61%	-0.62%	-0.63%	-0.65%	-0.69%	-0.74%	-0.78%	-0.81%	-0.83%	-0.84%
-medium	-0.68%	-0.71%	-0.74%	-0.76%	-0.78%	-0.85%	-0.94%	-0.98%	-1.01%	-1.00%	-1.00%
-high	-0.76%	-0.83%	-0.89%	-0.94%	-0.97%	-1.07%	-1.06%	-1.01%	-0.98%	-1.00%	-1.00%
Average number of hours worked per worker	-0.06%	-0.06%	-0.06%	-0.07%	-0.07%	-0.08%	-0.08%	-0.09%	-0.09%	-0.09%	-0.09%
Participation rate - 15-69 yrs. (change in pp)	-0.11	-0.12	-0.12	-0.12	-0.13	-0.13	-0.14	-0.15	-0.16	-0.16	-0.16
-low	-0.12	-0.12	-0.13	-0.13	-0.13	-0.13	-0.14	-0.15	-0.16	-0.17	-0.17
-medium	-0.14	-0.15	-0.15	-0.16	-0.17	-0.18	-0.19	-0.19	-0.20	-0.20	-0.20
-high	-0.08	-0.08	-0.08	-0.08	-0.07	-0.07	-0.09	-0.10	-0.11	-0.10	-0.10
Employment (no. of workers)	-0.25%	-0.26%	-0.27%	-0.28%	-0.29%	-0.31%	-0.33%	-0.35%	-0.36%	-0.37%	-0.37%
-low	-0.27%	-0.27%	-0.28%	-0.28%	-0.28%	-0.28%	-0.26%	-0.23%	-0.20%	-0.18%	-0.17%
-medium	-0.27%	-0.28%	-0.29%	-0.30%	-0.31%	-0.31%	-0.31%	-0.31%	-0.32%	-0.34%	-0.35%
-high	-0.20%	-0.22%	-0.23%	-0.25%	-0.26%	-0.32%	-0.42%	-0.49%	-0.54%	-0.54%	-0.54%
Unemployment rate (change in pp)	0.07	0.08	0.08	0.09	0.09	0.11	0.12	0.12	0.12	0.12	0.13
-low	0.08	0.08	0.08	0.09	0.09	0.10	0.11	0.12	0.13	0.13	0.13
-medium	0.07	0.08	0.08	0.08	0.09	0.10	0.12	0.12	0.13	0.13	0.13
-high	0.07	0.08	0.09	0.10	0.10	0.12	0.12	0.11	0.11	0.11	0.11
new persons - low	0.00%	0.24%	0.24%	0.24%	0.24%	0.24%	0.24%	0.24%	0.23%	0.22%	0.24%
new persons - medium	0.00%	0.34%	0.32%	0.31%	0.29%	0.22%	0.13%	0.09%	0.07%	0.08%	0.07%
new persons - high	0.00%	-0.60%	-0.58%	-0.56%	-0.54%	-0.45%	-0.34%	-0.29%	-0.26%	-0.27%	-0.27%
Revenue Share	68.32%	66.80%	65.52%	64.44%	63.52%	60.50%	57.91%	56.93%	56.74%	57.58%	57.59%

Table 41: Dynamic Impact of Income Tax Reform, Belgium

Income Tax Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	-0.31%	-0.34%	-0.36%	-0.38%	-0.39%	-0.44%	-0.49%	-0.52%	-0.55%	-0.55%	-0.56%
Investment	-0.77%	-0.72%	-0.68%	-0.65%	-0.62%	-0.55%	-0.55%	-0.57%	-0.59%	-0.59%	-0.59%
Consumption	-1.50%	-1.50%	-1.50%	-1.49%	-1.49%	-1.47%	-1.43%	-1.39%	-1.32%	-1.27%	-1.27%
Trade Balance (change in % of gdp)	0.21%	0.19%	0.17%	0.16%	0.14%	0.10%	0.03%	-0.01%	-0.08%	-0.12%	-0.12%
Gross wage rate (labour costs per hour)	0.41%	0.36%	0.33%	0.29%	0.26%	0.18%	0.13%	0.11%	0.10%	0.09%	0.09%
-low	0.17%	0.15%	0.14%	0.13%	0.11%	0.06%	-0.02%	-0.07%	-0.11%	-0.12%	-0.13%
-medium	0.27%	0.25%	0.22%	0.20%	0.18%	0.09%	-0.01%	-0.05%	-0.06%	-0.05%	-0.05%
-high	0.60%	0.53%	0.47%	0.43%	0.39%	0.30%	0.33%	0.38%	0.40%	0.37%	0.37%
Net wage rate	-0.79%	-0.83%	-0.87%	-0.90%	-0.92%	-1.01%	-1.06%	-1.07%	-1.08%	-1.08%	-1.09%
-low	-0.65%	-0.67%	-0.69%	-0.70%	-0.71%	-0.76%	-0.84%	-0.89%	-0.94%	-0.94%	-0.95%
-medium	-0.78%	-0.81%	-0.83%	-0.85%	-0.87%	-0.96%	-1.06%	-1.10%	-1.12%	-1.10%	-1.11%
-high	-0.91%	-0.98%	-1.03%	-1.08%	-1.12%	-1.21%	-1.18%	-1.13%	-1.11%	-1.14%	-1.14%
Average number of hours worked per worker	-0.06%	-0.06%	-0.07%	-0.07%	-0.07%	-0.08%	-0.09%	-0.09%	-0.09%	-0.09%	-0.09%
Participation rate - 15-69 yrs. (change in pp)	-0.10	-0.10	-0.10	-0.10	-0.10	-0.11	-0.12	-0.13	-0.14	-0.14	-0.14
-low	-0.10	-0.11	-0.11	-0.11	-0.11	-0.12	-0.12	-0.12	-0.13	-0.15	-0.15
-medium	-0.11	-0.12	-0.13	-0.13	-0.14	-0.14	-0.14	-0.15	-0.16	-0.16	-0.16
-high	-0.08	-0.07	-0.07	-0.06	-0.06	-0.06	-0.08	-0.10	-0.10	-0.10	-0.10
Employment (no. of workers)	-0.24%	-0.25%	-0.25%	-0.26%	-0.27%	-0.28%	-0.31%	-0.34%	-0.36%	-0.36%	-0.36%
-low	-0.29%	-0.29%	-0.29%	-0.29%	-0.29%	-0.28%	-0.23%	-0.19%	-0.15%	-0.14%	-0.13%
-medium	-0.25%	-0.26%	-0.27%	-0.27%	-0.27%	-0.27%	-0.27%	-0.27%	-0.31%	-0.33%	-0.34%
-high	-0.18%	-0.20%	-0.21%	-0.23%	-0.24%	-0.30%	-0.42%	-0.50%	-0.55%	-0.54%	-0.55%
Unemployment rate (change in pp)	0.07	0.08	0.08	0.09	0.09	0.10	0.11	0.12	0.12	0.12	0.12
-low	0.09	0.09	0.09	0.10	0.10	0.11	0.13	0.13	0.14	0.14	0.14
-medium	0.08	0.08	0.08	0.09	0.09	0.10	0.11	0.12	0.12	0.12	0.12
-high	0.06	0.07	0.07	0.08	0.08	0.09	0.09	0.09	0.08	0.08	0.08
new persons - low	0.00%	0.36%	0.36%	0.36%	0.36%	0.36%	0.34%	0.33%	0.30%	0.29%	0.31%
new persons - medium	0.00%	0.52%	0.46%	0.41%	0.35%	0.18%	0.08%	0.04%	0.02%	0.04%	0.03%
new persons - high	0.00%	-0.90%	-0.84%	-0.77%	-0.71%	-0.52%	-0.39%	-0.33%	-0.29%	-0.30%	-0.31%
Revenue Share	71.84%	68.74%	66.12%	63.93%	62.10%	56.81%	54.68%	55.29%	57.18%	59.09%	59.13%

Table 42: Dynamic Impact of Income Tax Reform, Czech Republic

Income Tax Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	-0.25%	-0.29%	-0.32%	-0.35%	-0.38%	-0.47%	-0.56%	-0.60%	-0.64%	-0.64%	-0.65%
Investment	-1.02%	-0.97%	-0.93%	-0.89%	-0.86%	-0.76%	-0.71%	-0.72%	-0.72%	-0.71%	-0.71%
Consumption	-1.17%	-1.19%	-1.20%	-1.21%	-1.22%	-1.27%	-1.31%	-1.32%	-1.30%	-1.28%	-1.28%
Trade Balance (change in % of gdp)	0.21%	0.18%	0.16%	0.14%	0.12%	0.06%	0.01%	-0.03%	-0.07%	-0.10%	-0.10%
Gross wage rate (labour costs per hour)	0.62%	0.56%	0.51%	0.47%	0.43%	0.30%	0.20%	0.17%	0.15%	0.15%	0.15%
-low	0.21%	0.19%	0.17%	0.16%	0.14%	0.08%	0.01%	-0.04%	-0.09%	-0.11%	-0.11%
-medium	0.43%	0.39%	0.36%	0.33%	0.30%	0.19%	0.07%	0.01%	-0.04%	-0.04%	-0.04%
-high	1.21%	1.11%	1.02%	0.95%	0.88%	0.70%	0.70%	0.81%	0.90%	0.87%	0.87%
Net wage rate	-0.90%	-0.95%	-1.00%	-1.04%	-1.07%	-1.19%	-1.29%	-1.32%	-1.34%	-1.35%	-1.35%
-low	-0.67%	-0.69%	-0.71%	-0.72%	-0.74%	-0.79%	-0.87%	-0.91%	-0.96%	-0.99%	-0.99%
-medium	-0.93%	-0.97%	-1.01%	-1.04%	-1.07%	-1.17%	-1.29%	-1.35%	-1.40%	-1.40%	-1.40%
-high	-0.98%	-1.08%	-1.16%	-1.24%	-1.30%	-1.48%	-1.48%	-1.38%	-1.29%	-1.31%	-1.31%
Average number of hours worked per worker	-0.07%	-0.07%	-0.08%	-0.08%	-0.08%	-0.09%	-0.10%	-0.11%	-0.11%	-0.11%	-0.11%
Participation rate - 15-69 yrs. (change in pp)	-0.13	-0.13	-0.14	-0.14	-0.15	-0.16	-0.17	-0.18	-0.19	-0.19	-0.19
-low	-0.11	-0.11	-0.12	-0.12	-0.12	-0.13	-0.14	-0.15	-0.16	-0.17	-0.17
-medium	-0.13	-0.14	-0.15	-0.16	-0.16	-0.18	-0.19	-0.20	-0.21	-0.21	-0.21
-high	-0.09	-0.09	-0.09	-0.09	-0.08	-0.08	-0.10	-0.12	-0.13	-0.13	-0.13
Employment (no. of workers)	-0.29%	-0.30%	-0.32%	-0.33%	-0.34%	-0.37%	-0.41%	-0.43%	-0.45%	-0.45%	-0.45%
-low	-0.33%	-0.33%	-0.34%	-0.35%	-0.35%	-0.36%	-0.34%	-0.32%	-0.28%	-0.25%	-0.25%
-medium	-0.30%	-0.31%	-0.33%	-0.34%	-0.34%	-0.37%	-0.39%	-0.39%	-0.40%	-0.41%	-0.41%
-high	-0.22%	-0.24%	-0.27%	-0.29%	-0.31%	-0.40%	-0.55%	-0.65%	-0.72%	-0.72%	-0.72%
Unemployment rate (change in pp)	0.10	0.10	0.11	0.11	0.11	0.13	0.14	0.15	0.15	0.15	0.15
-low	0.10	0.10	0.11	0.11	0.11	0.12	0.14	0.15	0.15	0.15	0.15
-medium	0.10	0.10	0.11	0.11	0.12	0.13	0.14	0.15	0.16	0.16	0.16
-high	0.08	0.09	0.09	0.10	0.11	0.13	0.13	0.12	0.11	0.11	0.11
new persons - low	0.00%	0.24%	0.24%	0.24%	0.25%	0.25%	0.26%	0.26%	0.26%	0.26%	0.26%
new persons - medium	0.00%	0.17%	0.17%	0.16%	0.15%	0.12%	0.08%	0.06%	0.05%	0.06%	0.05%
new persons - high	0.00%	-0.98%	-0.95%	-0.92%	-0.89%	-0.74%	-0.54%	-0.45%	-0.40%	-0.41%	-0.41%
Revenue Share	79.84%	76.97%	74.45%	72.23%	70.27%	63.60%	58.50%	57.36%	57.64%	58.90%	59.00%

Table 43: Dynamic Impact of Income Tax Reform, Spain

Income Tax Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	-0.24%	-0.28%	-0.31%	-0.34%	-0.37%	-0.47%	-0.57%	-0.62%	-0.68%	-0.71%	-0.71%
Investment	-0.90%	-0.87%	-0.83%	-0.81%	-0.78%	-0.72%	-0.70%	-0.72%	-0.75%	-0.75%	-0.76%
Consumption	-1.07%	-1.09%	-1.10%	-1.12%	-1.13%	-1.19%	-1.26%	-1.31%	-1.35%	-1.38%	-1.39%
Trade Balance (change in % of gdp)	0.19%	0.17%	0.14%	0.12%	0.11%	0.05%	0.00%	-0.02%	-0.05%	-0.07%	-0.07%
Gross wage rate (labour costs per hour)	0.60%	0.54%	0.50%	0.45%	0.42%	0.28%	0.18%	0.16%	0.14%	0.12%	0.12%
-low	0.25%	0.23%	0.21%	0.19%	0.18%	0.12%	0.04%	0.00%	-0.04%	-0.06%	-0.06%
-medium	0.45%	0.42%	0.38%	0.35%	0.32%	0.19%	0.02%	-0.05%	-0.08%	-0.05%	-0.05%
-high	0.93%	0.84%	0.76%	0.70%	0.64%	0.47%	0.42%	0.47%	0.50%	0.45%	0.45%
Net wage rate	-0.88%	-0.93%	-0.98%	-1.02%	-1.05%	-1.17%	-1.27%	-1.29%	-1.31%	-1.32%	-1.33%
-low	-0.75%	-0.77%	-0.79%	-0.80%	-0.82%	-0.88%	-0.95%	-1.00%	-1.04%	-1.05%	-1.06%
-medium	-0.93%	-0.96%	-1.00%	-1.03%	-1.06%	-1.19%	-1.35%	-1.43%	-1.46%	-1.42%	-1.43%
-high	-1.08%	-1.17%	-1.24%	-1.31%	-1.37%	-1.54%	-1.58%	-1.54%	-1.50%	-1.55%	-1.55%
Average number of hours worked per worker	-0.07%	-0.07%	-0.08%	-0.08%	-0.08%	-0.09%	-0.10%	-0.10%	-0.11%	-0.11%	-0.11%
Participation rate - 15-69 yrs. (change in pp)	-0.12	-0.12	-0.13	-0.13	-0.13	-0.13	-0.15	-0.16	-0.17	-0.18	-0.18
-low	-0.14	-0.14	-0.14	-0.14	-0.15	-0.16	-0.16	-0.17	-0.18	-0.20	-0.20
-medium	-0.13	-0.15	-0.16	-0.17	-0.18	-0.19	-0.19	-0.19	-0.21	-0.21	-0.21
-high	-0.08	-0.08	-0.07	-0.07	-0.07	-0.06	-0.09	-0.11	-0.13	-0.12	-0.12
Employment (no. of workers)	-0.30%	-0.32%	-0.33%	-0.34%	-0.35%	-0.38%	-0.42%	-0.45%	-0.48%	-0.49%	-0.49%
-low	-0.36%	-0.37%	-0.38%	-0.38%	-0.39%	-0.40%	-0.39%	-0.38%	-0.37%	-0.37%	-0.37%
-medium	-0.33%	-0.34%	-0.35%	-0.36%	-0.36%	-0.36%	-0.34%	-0.34%	-0.39%	-0.46%	-0.46%
-high	-0.20%	-0.22%	-0.24%	-0.26%	-0.28%	-0.37%	-0.52%	-0.62%	-0.71%	-0.69%	-0.70%
Unemployment rate (change in pp)	0.11	0.12	0.12	0.13	0.13	0.15	0.18	0.18	0.19	0.20	0.20
-low	0.13	0.14	0.14	0.14	0.15	0.16	0.18	0.19	0.20	0.21	0.21
-medium	0.11	0.12	0.13	0.13	0.14	0.17	0.19	0.21	0.22	0.21	0.21
-high	0.07	0.08	0.09	0.10	0.11	0.13	0.14	0.14	0.13	0.14	0.14
new persons - low	0.00%	0.18%	0.19%	0.19%	0.19%	0.20%	0.20%	0.20%	0.19%	0.18%	0.19%
new persons - medium	0.00%	0.81%	0.77%	0.72%	0.66%	0.41%	0.23%	0.13%	0.07%	0.10%	0.10%
new persons - high	0.00%	-0.89%	-0.87%	-0.83%	-0.79%	-0.64%	-0.50%	-0.42%	-0.36%	-0.37%	-0.37%
Revenue Share	70.82%	68.57%	66.59%	64.84%	63.31%	57.96%	53.62%	52.71%	53.58%	56.09%	56.37%

Table 44: Dynamic Impact of Income Tax Reform, Finland

Income Tax Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	-0.22%	-0.25%	-0.27%	-0.29%	-0.31%	-0.37%	-0.41%	-0.43%	-0.45%	-0.46%	-0.46%
Investment	-0.77%	-0.71%	-0.65%	-0.61%	-0.58%	-0.48%	-0.46%	-0.48%	-0.49%	-0.49%	-0.49%
Consumption	-1.14%	-1.15%	-1.17%	-1.18%	-1.18%	-1.21%	-1.24%	-1.25%	-1.24%	-1.24%	-1.24%
Trade Balance (change in % of gdp)	0.12%	0.10%	0.09%	0.07%	0.06%	0.03%	0.01%	-0.01%	-0.03%	-0.06%	-0.06%
Gross wage rate (labour costs per hour)	0.41%	0.36%	0.31%	0.27%	0.23%	0.13%	0.08%	0.07%	0.06%	0.05%	0.05%
-low	0.13%	0.11%	0.10%	0.09%	0.08%	0.04%	-0.01%	-0.04%	-0.08%	-0.09%	-0.10%
-medium	0.21%	0.18%	0.15%	0.13%	0.11%	0.03%	-0.07%	-0.12%	-0.16%	-0.15%	-0.15%
-high	0.63%	0.55%	0.48%	0.42%	0.37%	0.24%	0.24%	0.29%	0.32%	0.30%	0.30%
Net wage rate	-0.86%	-0.92%	-0.96%	-1.00%	-1.03%	-1.13%	-1.18%	-1.19%	-1.20%	-1.21%	-1.21%
-low	-0.85%	-0.87%	-0.88%	-0.90%	-0.91%	-0.95%	-0.99%	-1.02%	-1.06%	-1.07%	-1.08%
-medium	-0.86%	-0.89%	-0.92%	-0.94%	-0.97%	-1.04%	-1.14%	-1.19%	-1.23%	-1.22%	-1.22%
-high	-0.91%	-0.99%	-1.06%	-1.12%	-1.17%	-1.29%	-1.30%	-1.25%	-1.21%	-1.23%	-1.23%
Average number of hours worked per worker	-0.07%	-0.07%	-0.07%	-0.08%	-0.08%	-0.09%	-0.09%	-0.09%	-0.10%	-0.10%	-0.10%
Participation rate - 15-69 yrs. (change in pp)	-0.08	-0.08	-0.08	-0.09	-0.09	-0.09	-0.09	-0.10	-0.11	-0.11	-0.11
-low	-0.10	-0.10	-0.10	-0.11	-0.11	-0.11	-0.11	-0.11	-0.12	-0.13	-0.13
-medium	-0.09	-0.09	-0.10	-0.11	-0.11	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12
-high	-0.06	-0.05	-0.05	-0.05	-0.05	-0.05	-0.06	-0.07	-0.08	-0.08	-0.08
Employment (no. of workers)	-0.18%	-0.19%	-0.20%	-0.21%	-0.22%	-0.24%	-0.26%	-0.27%	-0.29%	-0.29%	-0.29%
-low	-0.23%	-0.24%	-0.24%	-0.24%	-0.25%	-0.25%	-0.23%	-0.20%	-0.17%	-0.16%	-0.15%
-medium	-0.20%	-0.21%	-0.21%	-0.22%	-0.22%	-0.23%	-0.21%	-0.19%	-0.20%	-0.22%	-0.22%
-high	-0.13%	-0.15%	-0.17%	-0.19%	-0.20%	-0.25%	-0.34%	-0.39%	-0.44%	-0.43%	-0.43%
Unemployment rate (change in pp)	0.06	0.07	0.07	0.08	0.08	0.10	0.11	0.12	0.12	0.12	0.12
-low	0.07	0.07	0.07	0.08	0.08	0.09	0.10	0.11	0.11	0.12	0.12
-medium	0.06	0.07	0.08	0.08	0.08	0.10	0.12	0.13	0.14	0.14	0.13
-high	0.05	0.06	0.07	0.08	0.08	0.10	0.10	0.10	0.09	0.09	0.09
new persons - low	0.00%	0.18%	0.18%	0.18%	0.18%	0.18%	0.19%	0.19%	0.18%	0.17%	0.19%
new persons - medium	0.00%	0.37%	0.35%	0.34%	0.32%	0.25%	0.17%	0.13%	0.10%	0.11%	0.10%
new persons - high	0.00%	-0.53%	-0.51%	-0.49%	-0.47%	-0.38%	-0.29%	-0.24%	-0.21%	-0.21%	-0.22%
Revenue Share	73.23%	70.19%	67.67%	65.57%	63.82%	58.73%	56.22%	56.34%	57.73%	59.86%	60.07%

Table 45: Dynamic Impact of Income Tax Reform, France

Income Tax Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	-0.22%	-0.24%	-0.26%	-0.28%	-0.30%	-0.35%	-0.40%	-0.42%	-0.46%	-0.47%	-0.48%
Investment	-0.70%	-0.65%	-0.61%	-0.57%	-0.54%	-0.46%	-0.44%	-0.46%	-0.48%	-0.49%	-0.49%
Consumption	-0.95%	-0.96%	-0.97%	-0.97%	-0.98%	-1.01%	-1.04%	-1.06%	-1.07%	-1.08%	-1.09%
Trade Balance (change in % of gdp)	0.11%	0.09%	0.07%	0.06%	0.05%	0.02%	0.00%	-0.01%	-0.03%	-0.04%	-0.04%
Gross wage rate (labour costs per hour)	0.37%	0.33%	0.29%	0.26%	0.24%	0.16%	0.11%	0.09%	0.08%	0.07%	0.07%
-low	0.23%	0.22%	0.20%	0.19%	0.19%	0.15%	0.11%	0.08%	0.05%	0.03%	0.03%
-medium	0.28%	0.25%	0.23%	0.21%	0.19%	0.12%	0.03%	-0.03%	-0.08%	-0.07%	-0.07%
-high	0.48%	0.42%	0.36%	0.32%	0.28%	0.18%	0.19%	0.25%	0.30%	0.28%	0.28%
Net wage rate	-0.74%	-0.77%	-0.81%	-0.83%	-0.86%	-0.93%	-0.98%	-1.00%	-1.01%	-1.02%	-1.02%
-low	-0.74%	-0.75%	-0.76%	-0.77%	-0.78%	-0.81%	-0.85%	-0.88%	-0.92%	-0.93%	-0.94%
-medium	-0.77%	-0.80%	-0.82%	-0.84%	-0.86%	-0.93%	-1.02%	-1.07%	-1.12%	-1.12%	-1.12%
-high	-0.76%	-0.83%	-0.88%	-0.92%	-0.96%	-1.06%	-1.05%	-0.99%	-0.94%	-0.96%	-0.96%
Average number of hours worked per worker	-0.06%	-0.06%	-0.06%	-0.07%	-0.07%	-0.08%	-0.08%	-0.09%	-0.09%	-0.09%	-0.09%
Participation rate - 15-69 yrs. (change in pp)	-0.09	-0.09	-0.10	-0.10	-0.10	-0.10	-0.11	-0.11	-0.12	-0.12	-0.12
-low	-0.12	-0.12	-0.13	-0.13	-0.13	-0.13	-0.14	-0.14	-0.15	-0.16	-0.16
-medium	-0.10	-0.10	-0.11	-0.11	-0.12	-0.12	-0.12	-0.13	-0.14	-0.14	-0.14
-high	-0.05	-0.05	-0.05	-0.04	-0.04	-0.03	-0.05	-0.06	-0.07	-0.07	-0.07
Employment (no. of workers)	-0.22%	-0.23%	-0.23%	-0.24%	-0.24%	-0.26%	-0.28%	-0.29%	-0.31%	-0.31%	-0.31%
-low	-0.31%	-0.32%	-0.32%	-0.32%	-0.33%	-0.33%	-0.32%	-0.31%	-0.29%	-0.28%	-0.27%
-medium	-0.22%	-0.23%	-0.24%	-0.24%	-0.24%	-0.24%	-0.22%	-0.21%	-0.22%	-0.25%	-0.25%
-high	-0.13%	-0.14%	-0.15%	-0.16%	-0.17%	-0.22%	-0.32%	-0.39%	-0.45%	-0.45%	-0.45%
Unemployment rate (change in pp)	0.07	0.08	0.08	0.08	0.09	0.10	0.11	0.11	0.11	0.12	0.12
-low	0.10	0.11	0.11	0.11	0.11	0.12	0.13	0.13	0.14	0.14	0.14
-medium	0.07	0.08	0.08	0.08	0.09	0.10	0.11	0.11	0.12	0.12	0.12
-high	0.05	0.05	0.06	0.06	0.07	0.08	0.08	0.07	0.07	0.06	0.07
new persons - low	0.00%	0.12%	0.12%	0.12%	0.12%	0.13%	0.14%	0.14%	0.14%	0.13%	0.14%
new persons - medium	0.00%	0.30%	0.29%	0.28%	0.27%	0.22%	0.15%	0.12%	0.09%	0.09%	0.09%
new persons - high	0.00%	-0.56%	-0.55%	-0.54%	-0.52%	-0.45%	-0.37%	-0.32%	-0.28%	-0.27%	-0.28%
Revenue Share	67.96%	66.05%	64.42%	63.03%	61.85%	58.03%	55.23%	54.43%	54.32%	55.23%	55.25%

Table 46: Dynamic Impact of Income Tax Reform, Netherlands

Income Tax Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	-0.24%	-0.27%	-0.29%	-0.32%	-0.34%	-0.40%	-0.49%	-0.55%	-0.62%	-0.66%	-0.66%
Investment	-1.06%	-0.99%	-0.93%	-0.88%	-0.84%	-0.74%	-0.76%	-0.81%	-0.85%	-0.85%	-0.86%
Consumption	-1.17%	-1.17%	-1.18%	-1.19%	-1.19%	-1.20%	-1.21%	-1.20%	-1.18%	-1.19%	-1.20%
Trade Balance (change in % of gdp)	0.23%	0.20%	0.18%	0.16%	0.15%	0.09%	0.03%	-0.01%	-0.08%	-0.11%	-0.11%
Gross wage rate (labour costs per hour)	0.47%	0.41%	0.36%	0.32%	0.28%	0.16%	0.08%	0.07%	0.04%	0.01%	0.01%
-low	0.04%	0.01%	-0.02%	-0.04%	-0.07%	-0.17%	-0.33%	-0.43%	-0.53%	-0.52%	-0.53%
-medium	0.16%	0.13%	0.10%	0.07%	0.04%	-0.07%	-0.23%	-0.32%	-0.37%	-0.36%	-0.36%
-high	0.94%	0.85%	0.78%	0.73%	0.68%	0.58%	0.69%	0.83%	0.90%	0.80%	0.80%
Net wage rate	-0.76%	-0.81%	-0.86%	-0.90%	-0.93%	-1.04%	-1.12%	-1.13%	-1.15%	-1.18%	-1.19%
-low	-0.32%	-0.35%	-0.37%	-0.40%	-0.42%	-0.52%	-0.67%	-0.78%	-0.88%	-0.88%	-0.90%
-medium	-0.63%	-0.66%	-0.69%	-0.72%	-0.75%	-0.86%	-1.02%	-1.10%	-1.16%	-1.15%	-1.15%
-high	-1.14%	-1.22%	-1.29%	-1.35%	-1.40%	-1.50%	-1.39%	-1.26%	-1.19%	-1.27%	-1.28%
Average number of hours worked per worker	-0.04%	-0.04%	-0.05%	-0.05%	-0.05%	-0.06%	-0.07%	-0.08%	-0.08%	-0.08%	-0.08%
Participation rate - 15-69 yrs. (change in pp)	-0.05	-0.05	-0.05	-0.05	-0.05	-0.04	-0.05	-0.07	-0.09	-0.10	-0.10
-low	-0.04	-0.04	-0.04	-0.04	-0.04	-0.03	-0.03	-0.05	-0.08	-0.11	-0.12
-medium	-0.06	-0.07	-0.07	-0.08	-0.08	-0.09	-0.08	-0.09	-0.10	-0.11	-0.10
-high	-0.07	-0.05	-0.04	-0.02	-0.01	0.02	-0.02	-0.06	-0.09	-0.07	-0.07
Employment (no. of workers)	-0.18%	-0.19%	-0.19%	-0.20%	-0.20%	-0.21%	-0.25%	-0.28%	-0.33%	-0.34%	-0.34%
-low	-0.13%	-0.12%	-0.11%	-0.10%	-0.09%	-0.02%	0.10%	0.20%	0.28%	0.27%	0.29%
-medium	-0.17%	-0.18%	-0.19%	-0.20%	-0.20%	-0.19%	-0.17%	-0.19%	-0.26%	-0.31%	-0.31%
-high	-0.21%	-0.24%	-0.25%	-0.27%	-0.29%	-0.39%	-0.61%	-0.78%	-0.90%	-0.86%	-0.87%
Unemployment rate (change in pp)	0.09	0.10	0.11	0.12	0.12	0.15	0.17	0.18	0.19	0.19	0.19
-low	0.07	0.08	0.09	0.09	0.10	0.12	0.16	0.19	0.22	0.23	0.23
-medium	0.09	0.10	0.10	0.11	0.11	0.13	0.16	0.18	0.19	0.19	0.19
-high	0.11	0.13	0.14	0.15	0.16	0.18	0.17	0.15	0.13	0.13	0.13
new persons - low	0.00%	0.98%	0.95%	0.94%	0.92%	0.91%	0.87%	0.80%	0.72%	0.68%	0.71%
new persons - medium	0.00%	0.58%	0.56%	0.54%	0.51%	0.33%	0.13%	0.04%	0.01%	0.05%	0.03%
new persons - high	0.00%	-1.51%	-1.47%	-1.42%	-1.38%	-1.15%	-0.86%	-0.70%	-0.60%	-0.61%	-0.62%
Revenue Share	67.90%	65.19%	62.91%	60.97%	59.34%	54.26%	50.60%	49.09%	47.51%	47.70%	47.80%

Table 47: Dynamic Impact of Income Tax Reform, Sweden

Income Tax Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	-0.29%	-0.31%	-0.33%	-0.35%	-0.36%	-0.40%	-0.43%	-0.44%	-0.45%	-0.46%	-0.46%
Investment	-0.74%	-0.68%	-0.64%	-0.60%	-0.57%	-0.48%	-0.44%	-0.44%	-0.46%	-0.46%	-0.48%
Consumption	-1.34%	-1.34%	-1.35%	-1.35%	-1.36%	-1.36%	-1.36%	-1.33%	-1.29%	-1.26%	-1.26%
Trade Balance (change in % of gdp)	0.15%	0.13%	0.12%	0.11%	0.10%	0.06%	0.02%	-0.01%	-0.05%	-0.08%	-0.09%
Gross wage rate (labour costs per hour)	0.35%	0.32%	0.28%	0.26%	0.23%	0.16%	0.11%	0.11%	0.11%	0.10%	0.10%
-low	0.19%	0.18%	0.16%	0.15%	0.15%	0.11%	0.08%	0.05%	0.02%	0.01%	-0.03%
-medium	0.25%	0.23%	0.21%	0.19%	0.17%	0.10%	0.03%	0.00%	-0.02%	-0.01%	0.00%
-high	0.52%	0.45%	0.40%	0.36%	0.33%	0.23%	0.24%	0.28%	0.32%	0.28%	0.28%
Net wage rate	-0.88%	-0.91%	-0.94%	-0.97%	-0.99%	-1.06%	-1.10%	-1.11%	-1.11%	-1.11%	-1.12%
-low	-0.82%	-0.84%	-0.85%	-0.86%	-0.87%	-0.90%	-0.93%	-0.96%	-0.99%	-1.00%	-1.04%
-medium	-0.89%	-0.91%	-0.93%	-0.95%	-0.97%	-1.03%	-1.10%	-1.14%	-1.16%	-1.14%	-1.13%
-high	-0.97%	-1.03%	-1.08%	-1.12%	-1.16%	-1.25%	-1.25%	-1.20%	-1.17%	-1.20%	-1.20%
Average number of hours worked per worker	-0.07%	-0.08%	-0.08%	-0.08%	-0.08%	-0.09%	-0.09%	-0.09%	-0.10%	-0.10%	-0.10%
Participation rate - 15-69 yrs. (change in pp)	-0.10	-0.10	-0.10	-0.10	-0.10	-0.11	-0.11	-0.12	-0.12	-0.12	-0.12
-low	-0.13	-0.13	-0.13	-0.13	-0.13	-0.14	-0.14	-0.14	-0.15	-0.15	-0.16
-medium	-0.11	-0.11	-0.12	-0.12	-0.13	-0.13	-0.13	-0.13	-0.14	-0.14	-0.14
-high	-0.06	-0.06	-0.06	-0.06	-0.06	-0.05	-0.07	-0.08	-0.09	-0.08	-0.08
Employment (no. of workers)	-0.23%	-0.24%	-0.25%	-0.25%	-0.26%	-0.27%	-0.29%	-0.30%	-0.31%	-0.31%	-0.31%
-low	-0.30%	-0.30%	-0.31%	-0.31%	-0.31%	-0.31%	-0.29%	-0.27%	-0.25%	-0.23%	-0.17%
-medium	-0.24%	-0.25%	-0.25%	-0.26%	-0.26%	-0.26%	-0.24%	-0.24%	-0.25%	-0.27%	-0.29%
-high	-0.17%	-0.19%	-0.20%	-0.21%	-0.23%	-0.27%	-0.35%	-0.40%	-0.43%	-0.41%	-0.42%
Unemployment rate (change in pp)	0.09	0.09	0.10	0.10	0.11	0.12	0.13	0.13	0.13	0.13	0.13
-low	0.10	0.11	0.11	0.11	0.12	0.12	0.13	0.14	0.14	0.15	0.16
-medium	0.09	0.09	0.10	0.10	0.10	0.11	0.12	0.13	0.13	0.13	0.13
-high	0.08	0.09	0.09	0.10	0.10	0.12	0.12	0.12	0.11	0.11	0.11
new persons - low	0.00%	0.27%	0.13%	0.11%	0.12%	0.15%	0.16%	0.17%	0.16%	0.15%	0.24%
new persons - medium	0.00%	0.24%	0.28%	0.28%	0.26%	0.19%	0.12%	0.08%	0.05%	0.06%	0.03%
new persons - high	0.00%	-0.51%	-0.49%	-0.47%	-0.45%	-0.36%	-0.27%	-0.22%	-0.17%	-0.17%	-0.19%
Revenue Share	62.50%	60.14%	58.19%	56.57%	55.25%	51.60%	50.82%	52.25%	55.15%	57.83%	57.75%

Table 48: Dynamic Impact of Income Tax Reform, Slovakia

Income Tax Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	-0.22%	-0.25%	-0.28%	-0.30%	-0.32%	-0.40%	-0.47%	-0.51%	-0.54%	-0.54%	-0.55%
Investment	-0.83%	-0.79%	-0.76%	-0.73%	-0.70%	-0.62%	-0.59%	-0.59%	-0.58%	-0.58%	-0.58%
Consumption	-0.99%	-1.01%	-1.02%	-1.03%	-1.04%	-1.09%	-1.14%	-1.16%	-1.17%	-1.17%	-1.17%
Trade Balance (change in % of gdp)	0.16%	0.14%	0.12%	0.10%	0.09%	0.04%	0.00%	-0.02%	-0.05%	-0.07%	-0.07%
Gross wage rate (labour costs per hour)	0.50%	0.45%	0.41%	0.38%	0.35%	0.24%	0.16%	0.14%	0.12%	0.12%	0.12%
-low	0.22%	0.20%	0.19%	0.18%	0.17%	0.12%	0.06%	0.02%	-0.02%	-0.03%	-0.04%
-medium	0.35%	0.32%	0.29%	0.26%	0.24%	0.15%	0.05%	0.00%	-0.04%	-0.04%	-0.04%
-high	0.97%	0.88%	0.80%	0.73%	0.68%	0.53%	0.56%	0.65%	0.71%	0.68%	0.68%
Net wage rate	-0.82%	-0.86%	-0.90%	-0.93%	-0.96%	-1.07%	-1.14%	-1.17%	-1.18%	-1.19%	-1.19%
-low	-0.61%	-0.63%	-0.64%	-0.66%	-0.67%	-0.71%	-0.77%	-0.81%	-0.85%	-0.87%	-0.87%
-medium	-0.81%	-0.84%	-0.87%	-0.89%	-0.92%	-1.01%	-1.11%	-1.16%	-1.19%	-1.19%	-1.19%
-high	-0.93%	-1.02%	-1.09%	-1.16%	-1.21%	-1.36%	-1.33%	-1.24%	-1.18%	-1.21%	-1.21%
Average number of hours worked per worker	-0.06%	-0.07%	-0.07%	-0.07%	-0.08%	-0.09%	-0.09%	-0.10%	-0.10%	-0.10%	-0.10%
Participation rate - 15-69 yrs. (change in pp)	-0.11	-0.12	-0.12	-0.12	-0.12	-0.13	-0.15	-0.15	-0.16	-0.16	-0.16
-low	-0.11	-0.12	-0.12	-0.12	-0.12	-0.13	-0.13	-0.14	-0.15	-0.16	-0.16
-medium	-0.12	-0.13	-0.13	-0.14	-0.14	-0.15	-0.16	-0.17	-0.18	-0.18	-0.18
-high	-0.07	-0.06	-0.06	-0.05	-0.05	-0.04	-0.07	-0.09	-0.10	-0.09	-0.09
Employment (no. of workers)	-0.24%	-0.25%	-0.26%	-0.27%	-0.28%	-0.31%	-0.34%	-0.36%	-0.37%	-0.38%	-0.38%
-low	-0.34%	-0.34%	-0.35%	-0.35%	-0.36%	-0.37%	-0.36%	-0.34%	-0.30%	-0.28%	-0.28%
-medium	-0.25%	-0.26%	-0.27%	-0.28%	-0.28%	-0.30%	-0.32%	-0.32%	-0.33%	-0.34%	-0.34%
-high	-0.16%	-0.18%	-0.19%	-0.21%	-0.23%	-0.30%	-0.43%	-0.52%	-0.57%	-0.57%	-0.57%
Unemployment rate (change in pp)	0.06	0.06	0.07	0.07	0.08	0.09	0.10	0.11	0.11	0.11	0.11
-low	0.06	0.06	0.06	0.07	0.07	0.08	0.09	0.09	0.09	0.09	0.09
-medium	0.06	0.07	0.07	0.07	0.08	0.09	0.10	0.10	0.11	0.11	0.11
-high	0.05	0.06	0.07	0.07	0.08	0.09	0.09	0.08	0.08	0.08	0.08
new persons - low	0.00%	0.19%	0.19%	0.20%	0.20%	0.20%	0.21%	0.21%	0.21%	0.21%	0.22%
new persons - medium	0.00%	0.17%	0.16%	0.15%	0.14%	0.11%	0.07%	0.05%	0.04%	0.05%	0.05%
new persons - high	0.00%	-0.91%	-0.88%	-0.84%	-0.80%	-0.63%	-0.44%	-0.36%	-0.33%	-0.35%	-0.35%
Revenue Share	80.75%	78.88%	77.23%	75.79%	74.52%	70.22%	67.04%	66.53%	67.55%	69.90%	70.15%

5.5. Dynamic Impact of Social Security Reform, Tables

Table 49: Dynamic Impact of Social Security Reform, Denmark

Social Security Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.27%	0.29%	0.31%	0.33%	0.34%	0.38%	0.35%	0.29%	0.20%	0.15%	0.15%
Investment	0.51%	0.47%	0.43%	0.39%	0.35%	0.19%	-0.03%	-0.14%	-0.22%	-0.22%	-0.22%
Consumption	0.62%	0.64%	0.65%	0.66%	0.67%	0.71%	0.78%	0.83%	0.88%	0.91%	0.93%
Trade Balance (change in % of gdp)	0.01%	0.03%	0.04%	0.05%	0.06%	0.08%	0.07%	0.03%	-0.02%	-0.04%	-0.04%
Gross wage rate (labour costs per hour)	-0.42%	-0.41%	-0.40%	-0.39%	-0.38%	-0.33%	-0.27%	-0.26%	-0.28%	-0.32%	-0.32%
-low	-0.98%	-1.04%	-1.10%	-1.14%	-1.19%	-1.37%	-1.66%	-1.86%	-2.00%	-1.98%	-1.97%
-medium	-0.40%	-0.38%	-0.35%	-0.33%	-0.31%	-0.21%	-0.13%	-0.11%	-0.13%	-0.18%	-0.18%
-high	-0.06%	-0.02%	0.02%	0.05%	0.08%	0.22%	0.48%	0.63%	0.70%	0.63%	0.62%
Net wage rate	0.68%	0.69%	0.70%	0.72%	0.73%	0.78%	0.83%	0.84%	0.82%	0.78%	0.78%
-low	1.77%	1.73%	1.69%	1.65%	1.62%	1.45%	1.13%	0.90%	0.71%	0.73%	0.74%
-medium	0.62%	0.64%	0.67%	0.69%	0.71%	0.81%	0.89%	0.91%	0.89%	0.85%	0.84%
-high	0.27%	0.31%	0.35%	0.38%	0.41%	0.55%	0.80%	0.95%	1.03%	0.96%	0.96%
Average number of hours worked per worker	0.05%	0.04%	0.04%	0.04%	0.04%	0.04%	0.05%	0.04%	0.04%	0.04%	0.04%
Participation rate - 15-69 yrs. (change in pp)	0.10	0.12	0.14	0.15	0.16	0.18	0.15	0.12	0.08	0.07	0.07
-low	0.26	0.27	0.28	0.28	0.29	0.31	0.30	0.26	0.16	0.10	0.11
-medium	0.08	0.11	0.12	0.13	0.13	0.13	0.11	0.10	0.09	0.10	0.10
-high	0.02	0.04	0.07	0.09	0.11	0.16	0.13	0.08	0.05	0.06	0.06
Employment (no. of workers)	0.44%	0.48%	0.50%	0.52%	0.54%	0.57%	0.53%	0.48%	0.41%	0.39%	0.39%
-low	1.14%	1.26%	1.36%	1.45%	1.52%	1.82%	2.22%	2.47%	2.63%	2.57%	2.56%
-medium	0.37%	0.37%	0.37%	0.37%	0.36%	0.30%	0.16%	0.05%	-0.06%	-0.08%	-0.08%
-high	0.09%	0.10%	0.11%	0.12%	0.12%	0.09%	-0.10%	-0.27%	-0.43%	-0.43%	-0.42%
Unemployment rate (change in pp)	-0.29	-0.29	-0.29	-0.29	-0.29	-0.30	-0.30	-0.29	-0.28	-0.27	-0.27
-low	-0.70	-0.69	-0.68	-0.67	-0.66	-0.60	-0.51	-0.45	-0.39	-0.38	-0.38
-medium	-0.25	-0.25	-0.26	-0.27	-0.27	-0.29	-0.31	-0.31	-0.31	-0.31	-0.31
-high	-0.06	-0.07	-0.08	-0.08	-0.09	-0.12	-0.16	-0.19	-0.21	-0.21	-0.21
new persons - low	0.00%	5.92%	5.14%	4.51%	4.04%	3.03%	2.51%	2.24%	2.01%	1.97%	1.98%
new persons - medium	0.00%	-1.95%	-1.53%	-1.20%	-0.97%	-0.73%	-0.65%	-0.59%	-0.54%	-0.53%	-0.53%
new persons - high	0.00%	-1.69%	-1.67%	-1.65%	-1.60%	-1.20%	-0.94%	-0.82%	-0.73%	-0.72%	-0.72%
Degree of Self-Financing	74.41%	76.57%	78.44%	80.06%	81.47%	85.90%	86.79%	83.10%	73.84%	65.06%	64.64%

Table 50: Dynamic Impact of Social Security Reform, Germany

Social Security Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.22%	0.22%	0.23%	0.24%	0.25%	0.28%	0.29%	0.29%	0.29%	0.28%	0.28%
Investment	0.55%	0.50%	0.46%	0.42%	0.39%	0.28%	0.20%	0.18%	0.17%	0.16%	0.16%
Consumption	0.71%	0.71%	0.72%	0.72%	0.73%	0.76%	0.80%	0.83%	0.85%	0.86%	0.86%
Trade Balance (change in % of gdp)	-0.08%	-0.03%	-0.01%	0.00%	0.01%	0.03%	0.03%	0.02%	0.01%	0.01%	0.01%
Gross wage rate (labour costs per hour)	-0.37%	-0.32%	-0.30%	-0.28%	-0.27%	-0.22%	-0.19%	-0.18%	-0.18%	-0.19%	-0.19%
-low	-0.74%	-0.71%	-0.71%	-0.70%	-0.70%	-0.68%	-0.68%	-0.69%	-0.70%	-0.71%	-0.71%
-medium	-0.43%	-0.39%	-0.38%	-0.36%	-0.36%	-0.33%	-0.32%	-0.33%	-0.35%	-0.35%	-0.35%
-high	-0.12%	-0.05%	-0.01%	0.02%	0.05%	0.14%	0.22%	0.26%	0.28%	0.28%	0.28%
Net wage rate	0.53%	0.58%	0.60%	0.62%	0.63%	0.68%	0.71%	0.72%	0.72%	0.71%	0.71%
-low	1.22%	1.24%	1.25%	1.25%	1.26%	1.27%	1.27%	1.27%	1.26%	1.25%	1.25%
-medium	0.67%	0.70%	0.72%	0.73%	0.74%	0.76%	0.77%	0.76%	0.75%	0.74%	0.74%
-high	0.24%	0.31%	0.35%	0.38%	0.40%	0.49%	0.58%	0.61%	0.64%	0.64%	0.63%
Average number of hours worked per worker	0.06%	0.06%	0.06%	0.06%	0.06%	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%
Participation rate - 15-69 yrs. (change in pp)	0.10	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.09	0.09
-low	0.19	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.17	0.17
-medium	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
-high	0.03	0.03	0.03	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05
Employment (no. of workers)	0.28%	0.27%	0.28%	0.28%	0.29%	0.30%	0.30%	0.30%	0.30%	0.29%	0.29%
-low	0.74%	0.72%	0.72%	0.72%	0.73%	0.74%	0.75%	0.75%	0.76%	0.76%	0.76%
-medium	0.29%	0.28%	0.28%	0.28%	0.29%	0.30%	0.31%	0.31%	0.31%	0.31%	0.31%
-high	0.08%	0.08%	0.09%	0.09%	0.10%	0.11%	0.10%	0.09%	0.07%	0.06%	0.06%
Unemployment rate (change in pp)	-0.12	-0.12	-0.12	-0.12	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13
-low	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33
-medium	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.13	-0.12	-0.12	-0.12	-0.12
-high	-0.04	-0.04	-0.04	-0.05	-0.05	-0.06	-0.07	-0.07	-0.08	-0.08	-0.08
new persons - low	0.00%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%
new persons - medium	0.00%	0.08%	0.07%	0.06%	0.06%	0.04%	0.04%	0.03%	0.03%	0.03%	0.03%
new persons - high	0.00%	-0.21%	-0.19%	-0.17%	-0.16%	-0.12%	-0.11%	-0.10%	-0.09%	-0.09%	-0.09%
Degree of Self-Financing	58.01%	48.50%	48.52%	48.90%	49.26%	50.43%	51.09%	50.78%	49.38%	47.53%	47.35%

Table 51: Dynamic Impact of Social Security Reform, Italy

Social Security Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.31%	0.33%	0.35%	0.36%	0.37%	0.41%	0.44%	0.43%	0.39%	0.35%	0.35%
Investment	0.56%	0.53%	0.51%	0.49%	0.47%	0.40%	0.30%	0.24%	0.19%	0.16%	0.17%
Consumption	0.77%	0.79%	0.80%	0.81%	0.82%	0.86%	0.93%	0.97%	1.01%	1.02%	1.02%
Trade Balance (change in % of gdp)	-0.06%	-0.05%	-0.04%	-0.03%	-0.02%	0.00%	0.01%	0.01%	0.02%	0.03%	0.03%
Gross wage rate (labour costs per hour)	-0.38%	-0.36%	-0.35%	-0.34%	-0.33%	-0.29%	-0.25%	-0.24%	-0.23%	-0.25%	-0.25%
-low	-0.68%	-0.68%	-0.67%	-0.67%	-0.67%	-0.67%	-0.70%	-0.73%	-0.76%	-0.77%	-0.77%
-medium	-0.23%	-0.21%	-0.20%	-0.19%	-0.18%	-0.13%	-0.08%	-0.06%	-0.06%	-0.08%	-0.08%
-high	0.03%	0.06%	0.09%	0.11%	0.13%	0.23%	0.39%	0.49%	0.56%	0.54%	0.52%
Net wage rate	0.57%	0.59%	0.60%	0.61%	0.62%	0.65%	0.69%	0.71%	0.71%	0.69%	0.69%
-low	0.97%	0.98%	0.98%	0.98%	0.98%	0.98%	0.96%	0.93%	0.89%	0.89%	0.89%
-medium	0.51%	0.53%	0.54%	0.55%	0.56%	0.61%	0.66%	0.68%	0.68%	0.67%	0.67%
-high	0.26%	0.29%	0.31%	0.33%	0.35%	0.45%	0.61%	0.71%	0.78%	0.76%	0.75%
Average number of hours worked per worker	0.09%	0.09%	0.09%	0.09%	0.09%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
Participation rate - 15-69 yrs. (change in pp)	0.20	0.20	0.21	0.21	0.21	0.22	0.22	0.21	0.19	0.18	0.18
-low	0.32	0.32	0.32	0.32	0.32	0.33	0.33	0.32	0.29	0.27	0.27
-medium	0.12	0.12	0.13	0.13	0.13	0.14	0.15	0.14	0.13	0.13	0.13
-high	0.03	0.05	0.06	0.08	0.08	0.11	0.11	0.11	0.09	0.09	0.09
Employment (no. of workers)	0.49%	0.50%	0.51%	0.52%	0.52%	0.54%	0.54%	0.53%	0.49%	0.47%	0.47%
-low	0.86%	0.87%	0.88%	0.89%	0.90%	0.94%	0.99%	1.02%	1.03%	1.01%	1.01%
-medium	0.30%	0.30%	0.31%	0.32%	0.32%	0.32%	0.30%	0.26%	0.21%	0.18%	0.18%
-high	0.09%	0.10%	0.11%	0.12%	0.13%	0.13%	0.06%	-0.01%	-0.10%	-0.12%	-0.11%
Unemployment rate (change in pp)	-0.15	-0.15	-0.15	-0.15	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16
-low	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.24	-0.24	-0.23	-0.23
-medium	-0.11	-0.11	-0.11	-0.11	-0.11	-0.12	-0.12	-0.13	-0.13	-0.12	-0.12
-high	-0.04	-0.04	-0.05	-0.05	-0.05	-0.06	-0.08	-0.09	-0.09	-0.10	-0.09
new persons - low	0.00%	0.40%	0.39%	0.38%	0.38%	0.34%	0.30%	0.28%	0.26%	0.25%	0.25%
new persons - medium	0.00%	-0.11%	-0.16%	-0.19%	-0.21%	-0.21%	-0.18%	-0.18%	-0.17%	-0.16%	-0.16%
new persons - high	0.00%	-0.96%	-0.80%	-0.69%	-0.61%	-0.51%	-0.45%	-0.41%	-0.37%	-0.35%	-0.35%
Degree of Self-Financing	66.01%	67.08%	68.03%	68.85%	69.56%	71.62%	70.64%	66.21%	56.11%	46.50%	45.95%

Table 52: Dynamic Impact of Social Security Reform, Austria

Social Security Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.20%	0.22%	0.23%	0.24%	0.25%	0.29%	0.31%	0.31%	0.30%	0.29%	0.29%
Investment	0.45%	0.42%	0.40%	0.37%	0.35%	0.28%	0.21%	0.18%	0.17%	0.17%	0.16%
Consumption	0.55%	0.56%	0.57%	0.58%	0.59%	0.64%	0.71%	0.76%	0.82%	0.86%	0.86%
Trade Balance (change in % of gdp)	-0.02%	-0.01%	0.00%	0.00%	0.01%	0.02%	0.02%	0.01%	0.01%	0.01%	0.01%
Gross wage rate (labour costs per hour)	-0.32%	-0.30%	-0.28%	-0.27%	-0.26%	-0.21%	-0.18%	-0.17%	-0.17%	-0.18%	-0.18%
-low	-0.76%	-0.76%	-0.75%	-0.75%	-0.75%	-0.74%	-0.76%	-0.77%	-0.80%	-0.81%	-0.81%
-medium	-0.31%	-0.29%	-0.28%	-0.27%	-0.26%	-0.23%	-0.22%	-0.22%	-0.23%	-0.23%	-0.23%
-high	-0.02%	0.01%	0.05%	0.08%	0.10%	0.20%	0.32%	0.36%	0.39%	0.38%	0.38%
Net wage rate	0.64%	0.66%	0.67%	0.69%	0.70%	0.74%	0.78%	0.78%	0.78%	0.78%	0.78%
-low	1.53%	1.54%	1.54%	1.55%	1.55%	1.56%	1.54%	1.53%	1.50%	1.49%	1.49%
-medium	0.67%	0.69%	0.70%	0.71%	0.72%	0.75%	0.77%	0.76%	0.76%	0.76%	0.75%
-high	0.26%	0.30%	0.33%	0.36%	0.39%	0.49%	0.60%	0.65%	0.68%	0.66%	0.66%
Average number of hours worked per worker	0.06%	0.06%	0.06%	0.06%	0.06%	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%
Participation rate - 15-69 yrs. (change in pp)	0.10	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.11	0.11	0.11
-low	0.26	0.26	0.26	0.26	0.26	0.27	0.27	0.26	0.25	0.24	0.24
-medium	0.09	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.09	0.09	0.09
-high	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05
Employment (no. of workers)	0.29%	0.29%	0.30%	0.30%	0.31%	0.32%	0.33%	0.32%	0.31%	0.31%	0.31%
-low	0.78%	0.79%	0.79%	0.80%	0.80%	0.82%	0.86%	0.88%	0.90%	0.91%	0.91%
-medium	0.24%	0.24%	0.25%	0.25%	0.25%	0.27%	0.27%	0.27%	0.25%	0.24%	0.24%
-high	0.06%	0.07%	0.08%	0.09%	0.09%	0.10%	0.08%	0.06%	0.03%	0.03%	0.03%
Unemployment rate (change in pp)	-0.12	-0.12	-0.12	-0.12	-0.12	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13
-low	-0.31	-0.31	-0.31	-0.31	-0.31	-0.31	-0.31	-0.31	-0.30	-0.30	-0.30
-medium	-0.10	-0.10	-0.10	-0.10	-0.10	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11
-high	-0.03	-0.04	-0.04	-0.04	-0.05	-0.06	-0.07	-0.07	-0.08	-0.07	-0.07
new persons - low	0.00%	0.18%	0.18%	0.18%	0.18%	0.18%	0.17%	0.17%	0.17%	0.16%	0.17%
new persons - medium	0.00%	0.04%	0.03%	0.03%	0.02%	0.01%	0.00%	-0.01%	-0.01%	-0.01%	-0.01%
new persons - high	0.00%	-0.30%	-0.28%	-0.26%	-0.25%	-0.19%	-0.15%	-0.13%	-0.12%	-0.12%	-0.12%
Degree of Self-Financing	61.82%	63.08%	64.17%	65.09%	65.87%	68.09%	67.48%	64.04%	56.78%	50.57%	50.11%

Table 53: Dynamic Impact of Social Security Reform, Poland

Social Security Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.25%	0.27%	0.29%	0.31%	0.32%	0.37%	0.39%	0.40%	0.40%	0.39%	0.39%
Investment	0.55%	0.51%	0.47%	0.44%	0.42%	0.34%	0.29%	0.28%	0.28%	0.28%	0.28%
Consumption	0.75%	0.76%	0.78%	0.79%	0.80%	0.84%	0.89%	0.92%	0.94%	0.94%	0.94%
Trade Balance (change in % of gdp)	-0.09%	-0.07%	-0.06%	-0.05%	-0.04%	-0.02%	-0.01%	0.00%	0.03%	0.05%	0.06%
Gross wage rate (labour costs per hour)	-0.41%	-0.37%	-0.34%	-0.32%	-0.30%	-0.23%	-0.19%	-0.18%	-0.18%	-0.18%	-0.18%
-low	-0.92%	-0.91%	-0.90%	-0.89%	-0.89%	-0.87%	-0.86%	-0.86%	-0.86%	-0.85%	-0.85%
-medium	-0.52%	-0.50%	-0.49%	-0.47%	-0.46%	-0.42%	-0.39%	-0.38%	-0.38%	-0.38%	-0.38%
-high	-0.01%	0.05%	0.09%	0.14%	0.17%	0.28%	0.34%	0.34%	0.34%	0.33%	0.33%
Net wage rate	0.47%	0.50%	0.53%	0.56%	0.58%	0.64%	0.69%	0.69%	0.69%	0.69%	0.69%
-low	1.40%	1.41%	1.42%	1.43%	1.43%	1.45%	1.46%	1.47%	1.46%	1.47%	1.47%
-medium	0.71%	0.73%	0.74%	0.76%	0.77%	0.81%	0.84%	0.85%	0.85%	0.85%	0.85%
-high	0.21%	0.26%	0.31%	0.35%	0.39%	0.49%	0.55%	0.56%	0.55%	0.55%	0.55%
Average number of hours worked per worker	0.07%	0.07%	0.07%	0.07%	0.07%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
Participation rate - 15-69 yrs. (change in pp)	0.15	0.15	0.16	0.16	0.16	0.17	0.18	0.18	0.17	0.17	0.17
-low	0.38	0.38	0.39	0.39	0.39	0.39	0.40	0.39	0.39	0.39	0.39
-medium	0.15	0.15	0.15	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17
-high	0.03	0.03	0.04	0.04	0.05	0.06	0.07	0.07	0.07	0.06	0.06
Employment (no. of workers)	0.36%	0.37%	0.38%	0.39%	0.40%	0.42%	0.43%	0.43%	0.43%	0.43%	0.43%
-low	1.02%	1.03%	1.04%	1.04%	1.05%	1.06%	1.07%	1.07%	1.07%	1.06%	1.06%
-medium	0.38%	0.39%	0.40%	0.41%	0.41%	0.43%	0.44%	0.44%	0.44%	0.43%	0.43%
-high	0.07%	0.08%	0.10%	0.11%	0.12%	0.15%	0.17%	0.18%	0.18%	0.18%	0.18%
Unemployment rate (change in pp)	-0.10	-0.10	-0.11	-0.11	-0.11	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12
-low	-0.23	-0.23	-0.23	-0.23	-0.23	-0.24	-0.24	-0.24	-0.24	-0.24	-0.24
-medium	-0.12	-0.12	-0.13	-0.13	-0.13	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14
-high	-0.03	-0.03	-0.04	-0.04	-0.04	-0.05	-0.06	-0.06	-0.06	-0.06	-0.06
new persons - low	0.00%	0.03%	0.03%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
new persons - medium	0.00%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%
new persons - high	0.00%	0.02%	0.03%	0.03%	0.03%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
Degree of Self-Financing	51.44%	52.84%	54.00%	54.95%	55.73%	57.63%	56.47%	53.03%	46.14%	39.72%	39.08%

Table 54: Dynamic Impact of Social Security Reform, United Kingdom

Social Security Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.23%	0.25%	0.26%	0.28%	0.29%	0.32%	0.33%	0.33%	0.31%	0.30%	0.30%
Investment	0.53%	0.48%	0.44%	0.41%	0.38%	0.28%	0.21%	0.18%	0.16%	0.16%	0.16%
Consumption	0.66%	0.67%	0.68%	0.69%	0.70%	0.75%	0.80%	0.83%	0.86%	0.87%	0.87%
Trade Balance (change in % of gdp)	-0.02%	-0.01%	0.00%	0.01%	0.02%	0.03%	0.02%	0.01%	0.00%	0.01%	0.01%
Gross wage rate (labour costs per hour)	-0.31%	-0.29%	-0.26%	-0.25%	-0.23%	-0.19%	-0.16%	-0.15%	-0.16%	-0.16%	-0.16%
-low	-0.53%	-0.52%	-0.52%	-0.51%	-0.51%	-0.51%	-0.52%	-0.54%	-0.56%	-0.57%	-0.57%
-medium	-0.39%	-0.37%	-0.36%	-0.35%	-0.34%	-0.32%	-0.32%	-0.33%	-0.35%	-0.36%	-0.36%
-high	-0.06%	-0.02%	0.02%	0.05%	0.07%	0.16%	0.25%	0.29%	0.31%	0.31%	0.31%
Net wage rate	0.56%	0.58%	0.60%	0.62%	0.63%	0.68%	0.70%	0.71%	0.70%	0.70%	0.70%
-low	1.14%	1.15%	1.15%	1.16%	1.16%	1.17%	1.15%	1.13%	1.11%	1.10%	1.10%
-medium	0.67%	0.69%	0.70%	0.71%	0.72%	0.74%	0.74%	0.72%	0.70%	0.70%	0.70%
-high	0.28%	0.32%	0.35%	0.38%	0.41%	0.49%	0.58%	0.62%	0.65%	0.64%	0.64%
Average number of hours worked per worker	0.05%	0.05%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%
Participation rate - 15-69 yrs. (change in pp)	0.12	0.13	0.13	0.13	0.14	0.15	0.15	0.14	0.14	0.13	0.13
-low	0.23	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.23	0.22	0.22
-medium	0.13	0.13	0.14	0.14	0.14	0.14	0.15	0.14	0.14	0.14	0.14
-high	0.03	0.04	0.04	0.05	0.06	0.07	0.07	0.07	0.06	0.06	0.06
Employment (no. of workers)	0.31%	0.32%	0.33%	0.33%	0.34%	0.36%	0.36%	0.36%	0.35%	0.34%	0.34%
-low	0.62%	0.63%	0.63%	0.64%	0.65%	0.67%	0.70%	0.72%	0.74%	0.75%	0.75%
-medium	0.32%	0.32%	0.33%	0.34%	0.34%	0.36%	0.37%	0.37%	0.36%	0.35%	0.35%
-high	0.08%	0.09%	0.10%	0.11%	0.12%	0.13%	0.11%	0.08%	0.05%	0.04%	0.04%
Unemployment rate (change in pp)	-0.12	-0.12	-0.12	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13
-low	-0.23	-0.23	-0.23	-0.23	-0.23	-0.23	-0.23	-0.23	-0.22	-0.22	-0.22
-medium	-0.12	-0.12	-0.12	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.12	-0.12
-high	-0.04	-0.04	-0.05	-0.05	-0.06	-0.07	-0.08	-0.08	-0.09	-0.09	-0.09
new persons - low	0.00%	0.20%	0.20%	0.20%	0.20%	0.19%	0.18%	0.17%	0.16%	0.16%	0.16%
new persons - medium	0.00%	0.17%	0.14%	0.11%	0.09%	0.05%	0.04%	0.04%	0.03%	0.03%	0.03%
new persons - high	0.00%	-0.36%	-0.32%	-0.29%	-0.27%	-0.21%	-0.18%	-0.17%	-0.16%	-0.15%	-0.15%
Degree of Self-Financing	52.96%	53.86%	54.62%	55.25%	55.78%	57.18%	56.74%	54.83%	50.89%	47.24%	46.99%

Table 55: Dynamic Impact of Social Security Reform, Belgium

Social Security Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.25%	0.27%	0.28%	0.29%	0.30%	0.32%	0.32%	0.29%	0.25%	0.22%	0.22%
Investment	0.39%	0.36%	0.34%	0.31%	0.29%	0.21%	0.11%	0.06%	0.03%	0.02%	0.02%
Consumption	0.85%	0.86%	0.87%	0.87%	0.88%	0.90%	0.92%	0.93%	0.92%	0.89%	0.89%
Trade Balance (change in % of gdp)	-0.04%	-0.04%	-0.03%	-0.02%	-0.02%	0.00%	0.01%	0.01%	0.02%	0.04%	0.04%
Gross wage rate (labour costs per hour)	-0.31%	-0.29%	-0.27%	-0.26%	-0.25%	-0.21%	-0.17%	-0.17%	-0.18%	-0.19%	-0.19%
-low	-0.61%	-0.61%	-0.60%	-0.60%	-0.61%	-0.62%	-0.68%	-0.72%	-0.77%	-0.78%	-0.77%
-medium	-0.36%	-0.35%	-0.34%	-0.33%	-0.33%	-0.32%	-0.33%	-0.36%	-0.39%	-0.39%	-0.39%
-high	-0.05%	-0.01%	0.01%	0.04%	0.06%	0.16%	0.29%	0.36%	0.40%	0.37%	0.37%
Net wage rate	0.59%	0.61%	0.62%	0.64%	0.65%	0.69%	0.72%	0.72%	0.71%	0.70%	0.70%
-low	1.13%	1.13%	1.14%	1.14%	1.14%	1.12%	1.06%	1.02%	0.97%	0.96%	0.96%
-medium	0.69%	0.71%	0.72%	0.72%	0.73%	0.74%	0.72%	0.70%	0.67%	0.66%	0.67%
-high	0.29%	0.32%	0.35%	0.38%	0.40%	0.50%	0.63%	0.70%	0.74%	0.71%	0.71%
Average number of hours worked per worker	0.06%	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%
Participation rate - 15-69 yrs. (change in pp)	0.11	0.12	0.12	0.12	0.12	0.13	0.13	0.12	0.10	0.10	0.10
-low	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.20	0.18	0.18
-medium	0.10	0.10	0.10	0.10	0.10	0.11	0.11	0.10	0.09	0.09	0.09
-high	0.03	0.04	0.05	0.06	0.07	0.08	0.07	0.06	0.05	0.06	0.06
Employment (no. of workers)	0.30%	0.31%	0.32%	0.33%	0.33%	0.34%	0.33%	0.32%	0.29%	0.28%	0.28%
-low	0.69%	0.69%	0.70%	0.71%	0.72%	0.76%	0.83%	0.87%	0.90%	0.90%	0.90%
-medium	0.28%	0.29%	0.29%	0.30%	0.30%	0.32%	0.32%	0.31%	0.28%	0.26%	0.26%
-high	0.07%	0.08%	0.09%	0.09%	0.10%	0.09%	0.01%	-0.05%	-0.12%	-0.12%	-0.12%
Unemployment rate (change in pp)	-0.11	-0.11	-0.12	-0.12	-0.12	-0.12	-0.12	-0.11	-0.11	-0.11	-0.11
-low	-0.24	-0.24	-0.24	-0.24	-0.24	-0.24	-0.23	-0.22	-0.22	-0.21	-0.21
-medium	-0.11	-0.11	-0.12	-0.12	-0.12	-0.12	-0.12	-0.11	-0.11	-0.11	-0.11
-high	-0.03	-0.03	-0.04	-0.04	-0.04	-0.05	-0.06	-0.07	-0.07	-0.07	-0.07
new persons - low	0.00%	0.47%	0.47%	0.47%	0.46%	0.42%	0.38%	0.36%	0.33%	0.32%	0.32%
new persons - medium	0.00%	0.37%	0.25%	0.16%	0.10%	0.04%	0.02%	0.01%	0.00%	0.00%	0.00%
new persons - high	0.00%	-0.83%	-0.69%	-0.59%	-0.52%	-0.41%	-0.36%	-0.33%	-0.30%	-0.28%	-0.29%
Degree of Self-Financing	60.96%	62.64%	64.04%	65.20%	66.17%	68.85%	68.23%	64.67%	57.61%	52.34%	52.26%

Table 56: Dynamic Impact of Social Security Reform, Czech Republic

Social Security Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.22%	0.24%	0.26%	0.27%	0.29%	0.33%	0.37%	0.37%	0.36%	0.36%	0.36%
Investment	0.54%	0.51%	0.49%	0.46%	0.44%	0.36%	0.29%	0.27%	0.26%	0.26%	0.26%
Consumption	0.83%	0.84%	0.85%	0.86%	0.87%	0.92%	0.97%	0.99%	0.99%	0.98%	0.97%
Trade Balance (change in % of gdp)	-0.09%	-0.08%	-0.07%	-0.06%	-0.05%	-0.02%	0.01%	0.02%	0.03%	0.05%	0.05%
Gross wage rate (labour costs per hour)	-0.41%	-0.38%	-0.35%	-0.33%	-0.31%	-0.24%	-0.19%	-0.17%	-0.17%	-0.17%	-0.17%
-low	-1.26%	-1.25%	-1.24%	-1.23%	-1.23%	-1.21%	-1.20%	-1.21%	-1.22%	-1.23%	-1.24%
-medium	-0.45%	-0.43%	-0.42%	-0.40%	-0.39%	-0.34%	-0.31%	-0.31%	-0.31%	-0.31%	-0.31%
-high	0.03%	0.08%	0.13%	0.17%	0.21%	0.35%	0.51%	0.57%	0.60%	0.59%	0.59%
Net wage rate	0.70%	0.73%	0.75%	0.77%	0.79%	0.86%	0.91%	0.93%	0.93%	0.93%	0.93%
-low	2.31%	2.32%	2.33%	2.34%	2.34%	2.36%	2.37%	2.36%	2.35%	2.34%	2.33%
-medium	0.84%	0.86%	0.88%	0.89%	0.91%	0.95%	0.98%	0.98%	0.98%	0.98%	0.98%
-high	0.19%	0.24%	0.29%	0.33%	0.37%	0.51%	0.67%	0.73%	0.76%	0.75%	0.75%
Average number of hours worked per worker	0.06%	0.07%	0.07%	0.07%	0.07%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
Participation rate - 15-69 yrs. (change in pp)	0.14	0.14	0.15	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.16
-low	0.41	0.41	0.41	0.41	0.41	0.41	0.42	0.41	0.41	0.41	0.41
-medium	0.13	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.15	0.15	0.15
-high	0.02	0.03	0.04	0.05	0.05	0.07	0.08	0.08	0.08	0.08	0.08
Employment (no. of workers)	0.31%	0.31%	0.32%	0.33%	0.33%	0.35%	0.37%	0.37%	0.36%	0.36%	0.36%
-low	1.17%	1.18%	1.18%	1.19%	1.19%	1.21%	1.24%	1.25%	1.27%	1.28%	1.28%
-medium	0.29%	0.30%	0.31%	0.31%	0.32%	0.34%	0.35%	0.35%	0.35%	0.35%	0.35%
-high	0.05%	0.07%	0.08%	0.09%	0.10%	0.12%	0.12%	0.11%	0.10%	0.10%	0.10%
Unemployment rate (change in pp)	-0.09	-0.09	-0.10	-0.10	-0.10	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11
-low	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33
-medium	-0.09	-0.10	-0.10	-0.10	-0.10	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11
-high	-0.02	-0.02	-0.03	-0.03	-0.04	-0.05	-0.07	-0.07	-0.07	-0.07	-0.07
new persons - low	0.00%	0.12%	0.11%	0.11%	0.11%	0.11%	0.11%	0.10%	0.10%	0.10%	0.11%
new persons - medium	0.00%	0.05%	0.04%	0.04%	0.04%	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%
new persons - high	0.00%	-0.30%	-0.28%	-0.25%	-0.24%	-0.17%	-0.12%	-0.10%	-0.09%	-0.09%	-0.09%
Degree of Self-Financing	50.25%	51.66%	52.87%	53.91%	54.81%	57.53%	58.04%	56.18%	52.42%	49.74%	49.49%

Table 57: Dynamic Impact of Social Security Reform, Spain

Social Security Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.26%	0.28%	0.30%	0.32%	0.33%	0.38%	0.41%	0.39%	0.35%	0.32%	0.32%
Investment	0.50%	0.47%	0.45%	0.43%	0.41%	0.32%	0.22%	0.17%	0.11%	0.09%	0.09%
Consumption	0.74%	0.76%	0.77%	0.79%	0.80%	0.87%	0.98%	1.05%	1.13%	1.16%	1.17%
Trade Balance (change in % of gdp)	-0.07%	-0.06%	-0.05%	-0.04%	-0.03%	0.00%	0.01%	0.01%	0.02%	0.02%	0.02%
Gross wage rate (labour costs per hour)	-0.55%	-0.52%	-0.50%	-0.48%	-0.46%	-0.39%	-0.33%	-0.31%	-0.31%	-0.33%	-0.34%
-low	-0.83%	-0.82%	-0.82%	-0.81%	-0.81%	-0.81%	-0.84%	-0.88%	-0.91%	-0.93%	-0.93%
-medium	-0.52%	-0.50%	-0.48%	-0.47%	-0.45%	-0.41%	-0.36%	-0.35%	-0.36%	-0.37%	-0.37%
-high	-0.12%	-0.08%	-0.03%	0.01%	0.04%	0.18%	0.36%	0.45%	0.52%	0.49%	0.48%
Net wage rate	0.61%	0.63%	0.65%	0.67%	0.69%	0.75%	0.81%	0.83%	0.83%	0.81%	0.81%
-low	1.22%	1.23%	1.23%	1.24%	1.24%	1.24%	1.21%	1.18%	1.13%	1.12%	1.12%
-medium	0.65%	0.67%	0.68%	0.70%	0.71%	0.76%	0.80%	0.81%	0.81%	0.79%	0.79%
-high	0.22%	0.27%	0.32%	0.35%	0.39%	0.53%	0.71%	0.80%	0.87%	0.84%	0.83%
Average number of hours worked per worker	0.09%	0.09%	0.09%	0.10%	0.10%	0.10%	0.11%	0.11%	0.11%	0.11%	0.11%
Participation rate - 15-69 yrs. (change in pp)	0.17	0.17	0.18	0.18	0.19	0.20	0.20	0.20	0.18	0.18	0.18
-low	0.28	0.28	0.29	0.29	0.29	0.30	0.30	0.29	0.28	0.26	0.26
-medium	0.12	0.12	0.12	0.13	0.13	0.14	0.14	0.14	0.14	0.14	0.14
-high	0.02	0.03	0.04	0.05	0.06	0.08	0.09	0.08	0.07	0.07	0.07
Employment (no. of workers)	0.53%	0.54%	0.55%	0.56%	0.57%	0.60%	0.60%	0.59%	0.57%	0.55%	0.55%
-low	0.89%	0.90%	0.92%	0.93%	0.94%	0.98%	1.04%	1.08%	1.10%	1.09%	1.08%
-medium	0.40%	0.41%	0.42%	0.43%	0.43%	0.44%	0.43%	0.39%	0.34%	0.31%	0.31%
-high	0.08%	0.09%	0.11%	0.11%	0.12%	0.13%	0.08%	0.02%	-0.06%	-0.07%	-0.07%
Unemployment rate (change in pp)	-0.24	-0.24	-0.24	-0.25	-0.25	-0.26	-0.26	-0.26	-0.25	-0.25	-0.25
-low	-0.39	-0.39	-0.39	-0.39	-0.39	-0.39	-0.39	-0.38	-0.37	-0.36	-0.36
-medium	-0.21	-0.21	-0.21	-0.22	-0.22	-0.23	-0.24	-0.24	-0.24	-0.24	-0.24
-high	-0.05	-0.05	-0.06	-0.06	-0.07	-0.08	-0.11	-0.12	-0.13	-0.13	-0.12
new persons - low	0.00%	0.37%	0.37%	0.37%	0.36%	0.34%	0.31%	0.29%	0.27%	0.26%	0.26%
new persons - medium	0.00%	0.04%	-0.04%	-0.09%	-0.13%	-0.16%	-0.16%	-0.16%	-0.16%	-0.16%	-0.15%
new persons - high	0.00%	-0.64%	-0.58%	-0.54%	-0.50%	-0.44%	-0.39%	-0.36%	-0.32%	-0.30%	-0.30%
Degree of Self-Financing	62.86%	64.11%	65.19%	66.12%	66.89%	68.87%	66.43%	59.90%	46.53%	36.12%	36.10%

Table 58: Dynamic Impact of Social Security Reform, Finland

Social Security Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.22%	0.23%	0.25%	0.26%	0.28%	0.31%	0.31%	0.29%	0.26%	0.24%	0.24%
Investment	0.46%	0.42%	0.38%	0.35%	0.32%	0.23%	0.14%	0.10%	0.07%	0.07%	0.07%
Consumption	0.76%	0.77%	0.78%	0.79%	0.80%	0.84%	0.89%	0.91%	0.92%	0.92%	0.92%
Trade Balance (change in % of gdp)	-0.06%	-0.05%	-0.04%	-0.03%	-0.03%	-0.01%	0.00%	0.00%	0.02%	0.04%	0.04%
Gross wage rate (labour costs per hour)	-0.38%	-0.35%	-0.32%	-0.30%	-0.28%	-0.23%	-0.19%	-0.18%	-0.19%	-0.20%	-0.20%
-low	-0.67%	-0.67%	-0.67%	-0.67%	-0.67%	-0.69%	-0.76%	-0.81%	-0.87%	-0.88%	-0.88%
-medium	-0.54%	-0.52%	-0.50%	-0.49%	-0.48%	-0.46%	-0.47%	-0.49%	-0.52%	-0.53%	-0.53%
-high	-0.10%	-0.04%	0.00%	0.03%	0.07%	0.18%	0.29%	0.35%	0.39%	0.38%	0.38%
Net wage rate	0.57%	0.60%	0.63%	0.65%	0.67%	0.72%	0.76%	0.76%	0.75%	0.74%	0.74%
-low	1.19%	1.20%	1.20%	1.20%	1.20%	1.19%	1.12%	1.06%	0.99%	0.98%	0.98%
-medium	0.81%	0.83%	0.85%	0.86%	0.87%	0.89%	0.88%	0.86%	0.83%	0.82%	0.82%
-high	0.26%	0.31%	0.35%	0.39%	0.42%	0.53%	0.65%	0.71%	0.75%	0.74%	0.73%
Average number of hours worked per worker	0.06%	0.06%	0.06%	0.06%	0.06%	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%
Participation rate - 15-69 yrs. (change in pp)	0.08	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.09	0.08	0.08
-low	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.17	0.15	0.15
-medium	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09
-high	0.02	0.03	0.04	0.04	0.05	0.07	0.06	0.05	0.05	0.05	0.05
Employment (no. of workers)	0.31%	0.32%	0.32%	0.33%	0.34%	0.36%	0.36%	0.34%	0.33%	0.32%	0.32%
-low	0.73%	0.74%	0.76%	0.77%	0.78%	0.84%	0.93%	1.00%	1.07%	1.08%	1.07%
-medium	0.35%	0.36%	0.37%	0.37%	0.38%	0.39%	0.40%	0.39%	0.37%	0.36%	0.36%
-high	0.07%	0.08%	0.09%	0.10%	0.10%	0.11%	0.06%	0.01%	-0.04%	-0.05%	-0.05%
Unemployment rate (change in pp)	-0.17	-0.17	-0.18	-0.18	-0.18	-0.19	-0.19	-0.18	-0.18	-0.18	-0.18
-low	-0.39	-0.39	-0.39	-0.39	-0.39	-0.38	-0.37	-0.36	-0.35	-0.34	-0.34
-medium	-0.20	-0.20	-0.20	-0.21	-0.21	-0.21	-0.21	-0.21	-0.20	-0.20	-0.20
-high	-0.04	-0.04	-0.05	-0.06	-0.06	-0.07	-0.09	-0.10	-0.10	-0.10	-0.10
new persons - low	0.00%	0.69%	0.68%	0.66%	0.65%	0.59%	0.52%	0.49%	0.46%	0.44%	0.44%
new persons - medium	0.00%	0.14%	0.11%	0.09%	0.07%	0.04%	0.02%	0.02%	0.01%	0.01%	0.01%
new persons - high	0.00%	-0.50%	-0.46%	-0.43%	-0.40%	-0.33%	-0.28%	-0.26%	-0.23%	-0.22%	-0.22%
Degree of Self-Financing	62.94%	64.66%	66.06%	67.20%	68.12%	70.32%	68.67%	64.30%	55.78%	48.60%	48.31%

Table 59: Dynamic Impact of Social Security Reform, France

Social Security Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.21%	0.23%	0.24%	0.25%	0.26%	0.29%	0.30%	0.30%	0.28%	0.26%	0.26%
Investment	0.45%	0.41%	0.38%	0.35%	0.32%	0.24%	0.16%	0.13%	0.11%	0.10%	0.10%
Consumption	0.51%	0.52%	0.53%	0.55%	0.56%	0.60%	0.68%	0.73%	0.79%	0.83%	0.83%
Trade Balance (change in % of gdp)	0.00%	0.01%	0.02%	0.02%	0.03%	0.04%	0.03%	0.01%	0.00%	-0.01%	-0.01%
Gross wage rate (labour costs per hour)	-0.40%	-0.37%	-0.35%	-0.33%	-0.32%	-0.27%	-0.25%	-0.24%	-0.25%	-0.26%	-0.26%
-low	-0.74%	-0.73%	-0.73%	-0.72%	-0.72%	-0.71%	-0.73%	-0.75%	-0.78%	-0.79%	-0.79%
-medium	-0.45%	-0.43%	-0.42%	-0.41%	-0.40%	-0.38%	-0.39%	-0.41%	-0.43%	-0.45%	-0.45%
-high	-0.03%	0.01%	0.04%	0.07%	0.10%	0.19%	0.29%	0.33%	0.37%	0.36%	0.36%
Net wage rate	0.60%	0.62%	0.64%	0.66%	0.67%	0.72%	0.75%	0.75%	0.74%	0.73%	0.73%
-low	1.26%	1.27%	1.27%	1.28%	1.28%	1.29%	1.27%	1.25%	1.22%	1.21%	1.21%
-medium	0.76%	0.78%	0.79%	0.80%	0.81%	0.83%	0.82%	0.80%	0.77%	0.76%	0.76%
-high	0.24%	0.28%	0.32%	0.35%	0.37%	0.47%	0.56%	0.61%	0.65%	0.64%	0.63%
Average number of hours worked per worker	0.06%	0.06%	0.06%	0.06%	0.06%	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%
Participation rate - 15-69 yrs. (change in pp)	0.13	0.13	0.13	0.13	0.14	0.14	0.14	0.14	0.13	0.13	0.13
-low	0.26	0.26	0.26	0.26	0.26	0.27	0.27	0.26	0.26	0.25	0.25
-medium	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.10
-high	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.05	0.04	0.05	0.05
Employment (no. of workers)	0.37%	0.37%	0.38%	0.39%	0.39%	0.40%	0.41%	0.40%	0.39%	0.38%	0.38%
-low	0.77%	0.78%	0.78%	0.79%	0.79%	0.81%	0.83%	0.85%	0.86%	0.86%	0.86%
-medium	0.33%	0.33%	0.34%	0.34%	0.35%	0.36%	0.37%	0.38%	0.37%	0.36%	0.36%
-high	0.06%	0.07%	0.08%	0.09%	0.09%	0.10%	0.07%	0.03%	-0.01%	-0.02%	-0.01%
Unemployment rate (change in pp)	-0.16	-0.16	-0.16	-0.16	-0.16	-0.17	-0.17	-0.17	-0.17	-0.16	-0.16
-low	-0.30	-0.31	-0.31	-0.31	-0.31	-0.31	-0.31	-0.30	-0.30	-0.30	-0.30
-medium	-0.15	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16
-high	-0.03	-0.04	-0.04	-0.04	-0.05	-0.05	-0.06	-0.07	-0.07	-0.07	-0.07
new persons - low	0.00%	0.12%	0.12%	0.12%	0.12%	0.12%	0.12%	0.11%	0.11%	0.11%	0.11%
new persons - medium	0.00%	0.14%	0.13%	0.11%	0.10%	0.06%	0.05%	0.04%	0.04%	0.03%	0.03%
new persons - high	0.00%	-0.34%	-0.31%	-0.29%	-0.27%	-0.22%	-0.19%	-0.18%	-0.17%	-0.16%	-0.16%
Degree of Self-Financing	67.62%	68.88%	69.95%	70.84%	71.59%	73.54%	72.46%	68.86%	61.84%	56.59%	56.54%

Table 60: Dynamic Impact of Social Security Reform, Netherlands

Social Security Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.21%	0.23%	0.24%	0.26%	0.27%	0.30%	0.30%	0.28%	0.23%	0.20%	0.20%
Investment	0.48%	0.44%	0.40%	0.37%	0.34%	0.23%	0.10%	0.05%	0.00%	-0.01%	0.00%
Consumption	0.62%	0.63%	0.64%	0.65%	0.66%	0.70%	0.77%	0.81%	0.85%	0.85%	0.85%
Trade Balance (change in % of gdp)	0.00%	0.01%	0.02%	0.02%	0.03%	0.04%	0.03%	0.02%	0.00%	-0.01%	-0.01%
Gross wage rate (labour costs per hour)	-0.37%	-0.35%	-0.33%	-0.31%	-0.30%	-0.26%	-0.22%	-0.22%	-0.23%	-0.25%	-0.25%
-low	-0.62%	-0.63%	-0.64%	-0.65%	-0.65%	-0.70%	-0.78%	-0.85%	-0.90%	-0.90%	-0.90%
-medium	-0.44%	-0.42%	-0.41%	-0.40%	-0.39%	-0.36%	-0.36%	-0.37%	-0.41%	-0.42%	-0.43%
-high	-0.08%	-0.04%	-0.01%	0.02%	0.04%	0.15%	0.31%	0.39%	0.45%	0.41%	0.40%
Net wage rate	0.58%	0.60%	0.62%	0.63%	0.65%	0.69%	0.72%	0.73%	0.72%	0.69%	0.69%
-low	1.20%	1.19%	1.19%	1.18%	1.18%	1.14%	1.05%	0.98%	0.92%	0.91%	0.92%
-medium	0.75%	0.77%	0.78%	0.79%	0.80%	0.83%	0.83%	0.81%	0.78%	0.76%	0.76%
-high	0.26%	0.30%	0.33%	0.36%	0.38%	0.49%	0.65%	0.73%	0.79%	0.75%	0.75%
Average number of hours worked per worker	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.09%	0.09%	0.08%	0.08%	0.08%
Participation rate - 15-69 yrs. (change in pp)	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.10	0.09	0.08	0.08
-low	0.18	0.18	0.18	0.19	0.19	0.20	0.20	0.19	0.16	0.14	0.14
-medium	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.08	0.08	0.08	0.08
-high	0.02	0.03	0.04	0.05	0.06	0.08	0.07	0.05	0.04	0.04	0.04
Employment (no. of workers)	0.32%	0.34%	0.35%	0.35%	0.36%	0.38%	0.38%	0.36%	0.33%	0.32%	0.32%
-low	0.66%	0.69%	0.71%	0.73%	0.75%	0.83%	0.94%	1.01%	1.07%	1.06%	1.05%
-medium	0.32%	0.32%	0.33%	0.33%	0.33%	0.34%	0.32%	0.30%	0.27%	0.25%	0.25%
-high	0.08%	0.09%	0.09%	0.10%	0.10%	0.10%	0.02%	-0.06%	-0.14%	-0.14%	-0.14%
Unemployment rate (change in pp)	-0.19	-0.19	-0.19	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.19	-0.19
-low	-0.36	-0.36	-0.36	-0.36	-0.36	-0.35	-0.33	-0.31	-0.30	-0.29	-0.29
-medium	-0.19	-0.20	-0.20	-0.20	-0.20	-0.21	-0.21	-0.21	-0.20	-0.20	-0.20
-high	-0.05	-0.06	-0.06	-0.07	-0.07	-0.09	-0.11	-0.12	-0.13	-0.13	-0.13
new persons - low	0.00%	0.95%	0.92%	0.90%	0.87%	0.76%	0.65%	0.60%	0.54%	0.52%	0.52%
new persons - medium	0.00%	0.00%	-0.01%	-0.03%	-0.04%	-0.06%	-0.07%	-0.07%	-0.07%	-0.07%	-0.07%
new persons - high	0.00%	-0.78%	-0.73%	-0.69%	-0.66%	-0.54%	-0.44%	-0.40%	-0.35%	-0.33%	-0.34%
Degree of Self-Financing	61.03%	62.47%	63.72%	64.80%	65.73%	68.61%	69.03%	66.45%	60.22%	54.70%	54.61%

Table 61: Dynamic Impact of Social Security Reform, Sweden

Social Security Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.22%	0.24%	0.25%	0.26%	0.27%	0.30%	0.30%	0.29%	0.25%	0.22%	0.22%
Investment	0.46%	0.42%	0.39%	0.36%	0.33%	0.25%	0.16%	0.12%	0.07%	0.05%	0.05%
Consumption	0.73%	0.74%	0.74%	0.75%	0.76%	0.79%	0.83%	0.85%	0.86%	0.86%	0.86%
Trade Balance (change in % of gdp)	-0.05%	-0.04%	-0.03%	-0.03%	-0.02%	-0.01%	0.00%	0.00%	0.02%	0.04%	0.04%
Gross wage rate (labour costs per hour)	-0.36%	-0.34%	-0.32%	-0.31%	-0.30%	-0.25%	-0.22%	-0.21%	-0.21%	-0.23%	-0.23%
-low	-0.68%	-0.71%	-0.73%	-0.74%	-0.75%	-0.81%	-0.94%	-1.04%	-1.11%	-1.06%	-1.05%
-medium	-0.39%	-0.38%	-0.36%	-0.34%	-0.33%	-0.29%	-0.27%	-0.27%	-0.28%	-0.31%	-0.31%
-high	-0.13%	-0.09%	-0.06%	-0.03%	-0.01%	0.08%	0.21%	0.29%	0.34%	0.31%	0.30%
Net wage rate	0.55%	0.56%	0.58%	0.59%	0.61%	0.65%	0.68%	0.69%	0.68%	0.67%	0.66%
-low	0.94%	0.92%	0.91%	0.90%	0.89%	0.83%	0.69%	0.59%	0.51%	0.55%	0.56%
-medium	0.67%	0.68%	0.70%	0.71%	0.73%	0.77%	0.79%	0.79%	0.78%	0.75%	0.75%
-high	0.34%	0.38%	0.41%	0.44%	0.46%	0.55%	0.68%	0.75%	0.81%	0.78%	0.77%
Average number of hours worked per worker	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%
Participation rate - 15-69 yrs. (change in pp)	0.10	0.11	0.12	0.12	0.13	0.13	0.13	0.12	0.11	0.10	0.10
-low	0.23	0.23	0.23	0.23	0.24	0.24	0.24	0.23	0.19	0.16	0.16
-medium	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.11
-high	0.03	0.04	0.05	0.06	0.07	0.09	0.09	0.07	0.06	0.06	0.06
Employment (no. of workers)	0.33%	0.34%	0.35%	0.36%	0.36%	0.38%	0.37%	0.36%	0.34%	0.32%	0.33%
-low	0.77%	0.82%	0.85%	0.88%	0.90%	1.00%	1.18%	1.30%	1.41%	1.37%	1.35%
-medium	0.32%	0.33%	0.33%	0.33%	0.33%	0.32%	0.30%	0.27%	0.24%	0.22%	0.23%
-high	0.10%	0.11%	0.12%	0.13%	0.13%	0.13%	0.06%	-0.01%	-0.09%	-0.08%	-0.07%
Unemployment rate (change in pp)	-0.17	-0.17	-0.17	-0.17	-0.18	-0.18	-0.18	-0.18	-0.17	-0.17	-0.17
-low	-0.38	-0.37	-0.37	-0.36	-0.36	-0.34	-0.33	-0.32	-0.30	-0.30	-0.30
-medium	-0.17	-0.17	-0.17	-0.18	-0.18	-0.18	-0.19	-0.19	-0.18	-0.18	-0.18
-high	-0.06	-0.06	-0.07	-0.07	-0.08	-0.09	-0.10	-0.11	-0.12	-0.12	-0.12
new persons - low	0.00%	3.09%	1.99%	1.49%	1.29%	1.12%	1.01%	0.92%	0.82%	0.76%	0.77%
new persons - medium	0.00%	-0.80%	-0.36%	-0.18%	-0.12%	-0.14%	-0.14%	-0.13%	-0.12%	-0.12%	-0.12%
new persons - high	0.00%	-0.66%	-0.64%	-0.62%	-0.59%	-0.46%	-0.39%	-0.35%	-0.30%	-0.28%	-0.28%
Degree of Self-Financing	69.94%	71.55%	72.85%	73.91%	74.78%	77.06%	76.15%	72.58%	64.74%	56.41%	55.88%

Table 62: Dynamic Impact of Social Security Reform, Slovakia

Social Security Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.20%	0.22%	0.23%	0.25%	0.26%	0.31%	0.34%	0.35%	0.35%	0.35%	0.35%
Investment	0.53%	0.50%	0.47%	0.45%	0.43%	0.36%	0.30%	0.28%	0.27%	0.27%	0.27%
Consumption	0.75%	0.76%	0.77%	0.78%	0.79%	0.83%	0.88%	0.91%	0.94%	0.95%	0.96%
Trade Balance (change in % of gdp)	-0.10%	-0.09%	-0.08%	-0.07%	-0.06%	-0.03%	0.00%	0.01%	0.03%	0.05%	0.05%
Gross wage rate (labour costs per hour)	-0.37%	-0.35%	-0.32%	-0.30%	-0.28%	-0.21%	-0.16%	-0.15%	-0.14%	-0.14%	-0.14%
-low	-0.87%	-0.86%	-0.85%	-0.84%	-0.83%	-0.81%	-0.78%	-0.77%	-0.75%	-0.75%	-0.75%
-medium	-0.43%	-0.41%	-0.39%	-0.38%	-0.36%	-0.32%	-0.29%	-0.28%	-0.28%	-0.28%	-0.28%
-high	-0.06%	0.00%	0.05%	0.09%	0.13%	0.27%	0.39%	0.43%	0.46%	0.46%	0.46%
Net wage rate	0.64%	0.66%	0.69%	0.71%	0.73%	0.79%	0.85%	0.86%	0.87%	0.87%	0.87%
-low	1.47%	1.48%	1.49%	1.50%	1.51%	1.54%	1.56%	1.58%	1.59%	1.60%	1.60%
-medium	0.76%	0.78%	0.80%	0.81%	0.83%	0.87%	0.90%	0.91%	0.91%	0.91%	0.91%
-high	0.22%	0.28%	0.33%	0.37%	0.41%	0.55%	0.67%	0.71%	0.74%	0.74%	0.74%
Average number of hours worked per worker	0.06%	0.06%	0.07%	0.07%	0.07%	0.07%	0.08%	0.08%	0.08%	0.08%	0.08%
Participation rate - 15-69 yrs. (change in pp)	0.11	0.12	0.12	0.12	0.13	0.13	0.14	0.14	0.14	0.14	0.14
-low	0.25	0.25	0.25	0.25	0.25	0.26	0.26	0.26	0.26	0.27	0.27
-medium	0.12	0.12	0.12	0.13	0.13	0.13	0.14	0.14	0.14	0.14	0.14
-high	0.02	0.03	0.03	0.04	0.04	0.05	0.06	0.06	0.06	0.06	0.06
Employment (no. of workers)	0.25%	0.26%	0.26%	0.27%	0.28%	0.30%	0.31%	0.31%	0.32%	0.31%	0.31%
-low	0.81%	0.82%	0.82%	0.83%	0.83%	0.83%	0.83%	0.81%	0.79%	0.78%	0.78%
-medium	0.26%	0.27%	0.28%	0.28%	0.29%	0.31%	0.32%	0.33%	0.33%	0.33%	0.33%
-high	0.05%	0.06%	0.08%	0.09%	0.09%	0.12%	0.14%	0.14%	0.14%	0.14%	0.14%
Unemployment rate (change in pp)	-0.06	-0.07	-0.07	-0.07	-0.07	-0.08	-0.09	-0.09	-0.09	-0.09	-0.09
-low	-0.17	-0.17	-0.17	-0.17	-0.17	-0.18	-0.18	-0.18	-0.18	-0.18	-0.18
-medium	-0.08	-0.08	-0.08	-0.08	-0.08	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09
-high	-0.02	-0.03	-0.03	-0.03	-0.04	-0.05	-0.06	-0.07	-0.07	-0.07	-0.07
new persons – low	0.00%	-0.11%	-0.11%	-0.11%	-0.11%	-0.10%	-0.10%	-0.10%	-0.10%	-0.10%	-0.10%
new persons – medium	0.00%	0.04%	0.03%	0.03%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
new persons – high	0.00%	-0.12%	-0.09%	-0.07%	-0.06%	-0.04%	-0.04%	-0.03%	-0.03%	-0.03%	-0.03%
Degree of Self-Financing	47.05%	48.10%	49.00%	49.77%	50.41%	52.19%	51.46%	48.45%	42.26%	36.59%	36.07%

5.6. Dynamic Impact of Training Subsidy, Tables

Table 63: Dynamic Impact of Training Subsidy, Denmark

Training Subsidy Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.18%	0.20%	0.23%	0.25%	0.26%	0.32%	0.38%	0.40%	0.43%	0.43%	0.43%
Investment	0.79%	0.74%	0.70%	0.67%	0.64%	0.55%	0.51%	0.52%	0.52%	0.52%	0.50%
Consumption	0.57%	0.58%	0.59%	0.59%	0.60%	0.62%	0.65%	0.67%	0.69%	0.71%	0.72%
Gross wage rate (labour costs per hour)	0.37%	0.41%	0.45%	0.48%	0.50%	0.59%	0.65%	0.66%	0.67%	0.68%	0.67%
-low	0.35%	0.37%	0.39%	0.41%	0.43%	0.50%	0.59%	0.64%	0.66%	0.65%	0.62%
-medium	0.42%	0.44%	0.46%	0.48%	0.50%	0.55%	0.60%	0.61%	0.62%	0.63%	0.64%
-high	0.35%	0.41%	0.46%	0.51%	0.55%	0.66%	0.70%	0.68%	0.67%	0.69%	0.70%
Net wage rate	0.38%	0.42%	0.46%	0.48%	0.51%	0.60%	0.65%	0.66%	0.67%	0.68%	0.68%
-low	0.35%	0.37%	0.39%	0.41%	0.42%	0.49%	0.58%	0.63%	0.66%	0.65%	0.62%
-medium	0.42%	0.45%	0.47%	0.48%	0.50%	0.55%	0.60%	0.61%	0.63%	0.63%	0.64%
-high	0.35%	0.41%	0.46%	0.51%	0.55%	0.66%	0.70%	0.68%	0.67%	0.69%	0.70%
Effective Employment	0.25%	0.27%	0.29%	0.30%	0.31%	0.34%	0.37%	0.38%	0.40%	0.40%	0.40%
Average number of hours worked per worker	0.03%	0.04%	0.04%	0.04%	0.04%	0.05%	0.06%	0.06%	0.06%	0.06%	0.06%
Participation rate - 15-69 yrs. (change in pp)	0.03	0.03	0.04	0.04	0.04	0.04	0.05	0.06	0.06	0.06	0.06
-low	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.06	0.08	0.09	0.08
-medium	0.04	0.04	0.05	0.05	0.05	0.06	0.06	0.07	0.07	0.07	0.07
-high	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.04	0.04	0.04	0.04
Employment (no. of workers)	0.13%	0.14%	0.15%	0.16%	0.17%	0.19%	0.22%	0.24%	0.26%	0.25%	0.25%
-low	0.17%	0.16%	0.16%	0.15%	0.15%	0.10%	0.03%	-0.02%	-0.04%	-0.02%	0.02%
-medium	0.15%	0.16%	0.18%	0.19%	0.20%	0.22%	0.26%	0.28%	0.30%	0.30%	0.29%
-high	0.09%	0.11%	0.12%	0.14%	0.15%	0.21%	0.30%	0.35%	0.38%	0.37%	0.35%
Unemployment rate (change in pp)	-0.08	-0.09	-0.10	-0.10	-0.11	-0.13	-0.15	-0.15	-0.15	-0.15	-0.15
-low	-0.10	-0.11	-0.11	-0.12	-0.12	-0.15	-0.17	-0.19	-0.20	-0.20	-0.19
-medium	-0.09	-0.10	-0.10	-0.11	-0.11	-0.13	-0.14	-0.14	-0.15	-0.15	-0.15
-high	-0.06	-0.07	-0.08	-0.09	-0.10	-0.12	-0.13	-0.13	-0.13	-0.13	-0.13
"Individual" Labour Productivity	0.09%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.09%	0.09%	0.10%	0.10%
new persons - low	0.00%	-0.78%	-0.77%	-0.75%	-0.74%	-0.65%	-0.51%	-0.42%	-0.36%	-0.36%	-0.30%
new persons – medium	0.00%	0.08%	0.08%	0.07%	0.07%	0.07%	0.08%	0.08%	0.06%	0.06%	0.04%
new persons – high	0.00%	0.44%	0.43%	0.43%	0.42%	0.36%	0.25%	0.20%	0.17%	0.18%	0.16%
Degree of Self-Financing	59.07%	63.64%	67.65%	71.03%	73.85%	82.74%	88.84%	89.83%	88.13%	82.73%	80.68%

Table 64: Dynamic Impact of Training Subsidy, Germany

Training Subsidy Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.19%	0.20%	0.22%	0.24%	0.25%	0.30%	0.34%	0.35%	0.37%	0.38%	0.38%
Investment	0.94%	0.85%	0.78%	0.72%	0.67%	0.52%	0.45%	0.45%	0.45%	0.45%	0.44%
Consumption	0.65%	0.65%	0.66%	0.67%	0.67%	0.69%	0.71%	0.73%	0.74%	0.75%	0.75%
Gross wage rate (labour costs per hour)	0.32%	0.37%	0.41%	0.44%	0.47%	0.55%	0.61%	0.62%	0.63%	0.63%	0.63%
-low	0.20%	0.23%	0.24%	0.25%	0.26%	0.30%	0.34%	0.36%	0.38%	0.39%	0.39%
-medium	0.38%	0.41%	0.44%	0.46%	0.48%	0.54%	0.61%	0.64%	0.67%	0.67%	0.67%
-high	0.27%	0.36%	0.42%	0.47%	0.51%	0.63%	0.65%	0.61%	0.58%	0.59%	0.59%
Net wage rate	0.32%	0.38%	0.41%	0.45%	0.47%	0.56%	0.61%	0.62%	0.63%	0.64%	0.63%
-low	0.23%	0.25%	0.26%	0.27%	0.28%	0.32%	0.36%	0.38%	0.41%	0.42%	0.41%
-medium	0.38%	0.42%	0.45%	0.47%	0.48%	0.55%	0.62%	0.65%	0.68%	0.68%	0.68%
-high	0.27%	0.36%	0.42%	0.47%	0.52%	0.63%	0.65%	0.62%	0.58%	0.60%	0.60%
Effective Employment	0.25%	0.25%	0.26%	0.27%	0.28%	0.30%	0.32%	0.33%	0.34%	0.34%	0.34%
Average number of hours worked per worker	0.03%	0.04%	0.04%	0.04%	0.04%	0.05%	0.06%	0.06%	0.06%	0.06%	0.06%
Participation rate - 15-69 yrs. (change in pp)	0.05	0.04	0.05	0.05	0.05	0.05	0.06	0.06	0.07	0.07	0.07
-low	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.06	0.06
-medium	0.05	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.08	0.08
-high	0.03	0.02	0.02	0.02	0.02	0.02	0.03	0.04	0.05	0.04	0.04
Employment (no. of workers)	0.14%	0.14%	0.15%	0.16%	0.16%	0.18%	0.19%	0.20%	0.22%	0.22%	0.22%
-low	0.19%	0.18%	0.18%	0.18%	0.18%	0.18%	0.16%	0.15%	0.13%	0.12%	0.12%
-medium	0.16%	0.16%	0.16%	0.17%	0.17%	0.18%	0.17%	0.17%	0.18%	0.19%	0.19%
-high	0.09%	0.10%	0.11%	0.12%	0.13%	0.18%	0.25%	0.30%	0.34%	0.33%	0.33%
Unemployment rate (change in pp)	-0.07	-0.07	-0.07	-0.08	-0.08	-0.09	-0.10	-0.10	-0.10	-0.10	-0.10
-low	-0.09	-0.09	-0.09	-0.09	-0.10	-0.10	-0.11	-0.11	-0.12	-0.12	-0.12
-medium	-0.07	-0.07	-0.07	-0.08	-0.08	-0.09	-0.09	-0.10	-0.10	-0.10	-0.10
-high	-0.05	-0.05	-0.06	-0.07	-0.07	-0.09	-0.09	-0.09	-0.08	-0.08	-0.08
"Individual" Labour Productivity	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%
new persons - low	0.00%	-0.12%	-0.12%	-0.12%	-0.12%	-0.13%	-0.13%	-0.13%	-0.13%	-0.13%	-0.13%
new persons - medium	0.00%	-0.14%	-0.14%	-0.14%	-0.13%	-0.11%	-0.08%	-0.06%	-0.05%	-0.05%	-0.05%
new persons - high	0.00%	0.38%	0.38%	0.37%	0.36%	0.32%	0.25%	0.21%	0.18%	0.18%	0.18%
Degree of Self-Financing	38.15%	30.31%	31.18%	32.20%	33.09%	35.99%	38.62%	39.53%	39.09%	36.88%	36.43%

Table 65: Dynamic Impact of Training Subsidy, Italy

Training Subsidy Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.21%	0.24%	0.27%	0.30%	0.32%	0.39%	0.47%	0.51%	0.56%	0.58%	0.58%
Investment	0.89%	0.87%	0.85%	0.83%	0.81%	0.75%	0.73%	0.74%	0.77%	0.77%	0.76%
Consumption	0.68%	0.69%	0.71%	0.72%	0.72%	0.75%	0.79%	0.81%	0.83%	0.84%	0.84%
Gross wage rate (labour costs per hour)	0.47%	0.49%	0.51%	0.53%	0.55%	0.62%	0.68%	0.70%	0.71%	0.73%	0.73%
-low	0.18%	0.20%	0.21%	0.23%	0.24%	0.29%	0.38%	0.43%	0.47%	0.48%	0.47%
-medium	0.48%	0.50%	0.52%	0.53%	0.55%	0.63%	0.71%	0.75%	0.75%	0.75%	0.75%
-high	0.86%	0.88%	0.90%	0.92%	0.95%	1.00%	0.90%	0.77%	0.71%	0.81%	0.81%
Net wage rate	0.46%	0.48%	0.50%	0.51%	0.53%	0.60%	0.66%	0.68%	0.69%	0.71%	0.71%
-low	0.18%	0.20%	0.22%	0.23%	0.24%	0.30%	0.38%	0.43%	0.48%	0.49%	0.48%
-medium	0.48%	0.50%	0.51%	0.53%	0.55%	0.62%	0.71%	0.74%	0.75%	0.75%	0.75%
-high	0.86%	0.88%	0.90%	0.92%	0.95%	1.00%	0.90%	0.78%	0.71%	0.81%	0.81%
Effective Employment	0.27%	0.29%	0.31%	0.32%	0.33%	0.36%	0.39%	0.41%	0.43%	0.44%	0.44%
Average number of hours worked per worker	0.03%	0.04%	0.04%	0.04%	0.04%	0.04%	0.05%	0.05%	0.05%	0.05%	0.05%
Participation rate - 15-69 yrs. (change in pp)	0.07	0.08	0.08	0.09	0.09	0.10	0.11	0.12	0.14	0.14	0.14
-low	0.05	0.05	0.06	0.06	0.07	0.08	0.09	0.09	0.11	0.13	0.12
-medium	0.08	0.10	0.11	0.12	0.13	0.14	0.15	0.15	0.15	0.15	0.15
-high	0.09	0.08	0.07	0.07	0.06	0.04	0.07	0.10	0.11	0.09	0.09
Employment (no. of workers)	0.16%	0.18%	0.19%	0.20%	0.21%	0.23%	0.27%	0.29%	0.32%	0.33%	0.32%
-low	0.13%	0.14%	0.15%	0.15%	0.15%	0.15%	0.12%	0.09%	0.06%	0.06%	0.07%
-medium	0.17%	0.19%	0.21%	0.23%	0.24%	0.25%	0.28%	0.31%	0.37%	0.41%	0.39%
-high	0.19%	0.22%	0.25%	0.27%	0.29%	0.38%	0.59%	0.75%	0.85%	0.78%	0.78%
Unemployment rate (change in pp)	-0.04	-0.05	-0.05	-0.05	-0.05	-0.06	-0.07	-0.08	-0.08	-0.08	-0.08
-low	-0.04	-0.04	-0.04	-0.05	-0.05	-0.06	-0.07	-0.08	-0.09	-0.09	-0.09
-medium	-0.04	-0.04	-0.05	-0.05	-0.05	-0.06	-0.07	-0.07	-0.08	-0.08	-0.08
-high	-0.05	-0.06	-0.06	-0.06	-0.06	-0.07	-0.06	-0.05	-0.04	-0.05	-0.05
"Individual" Labour Productivity	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.08%	0.09%	0.09%
new persons - low	0.00%	-0.32%	-0.33%	-0.33%	-0.33%	-0.34%	-0.32%	-0.30%	-0.28%	-0.27%	-0.26%
new persons - medium	0.00%	-0.34%	-0.29%	-0.24%	-0.19%	-0.03%	0.06%	0.10%	0.11%	0.09%	0.08%
new persons - high	0.00%	1.94%	1.81%	1.68%	1.55%	1.13%	0.84%	0.68%	0.56%	0.59%	0.58%
Degree of Self-Financing	52.43%	56.40%	59.97%	62.70%	64.62%	69.30%	70.05%	66.59%	58.94%	50.37%	48.91%

Table 66: Dynamic Impact of Training Subsidy, Austria

Training Subsidy Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.16%	0.18%	0.20%	0.22%	0.23%	0.28%	0.33%	0.35%	0.37%	0.37%	0.37%
Investment	0.68%	0.64%	0.61%	0.58%	0.55%	0.47%	0.43%	0.42%	0.43%	0.42%	0.42%
Consumption	0.49%	0.50%	0.51%	0.52%	0.53%	0.56%	0.60%	0.63%	0.67%	0.69%	0.70%
Gross wage rate (labour costs per hour)	0.40%	0.43%	0.46%	0.48%	0.50%	0.58%	0.63%	0.64%	0.65%	0.66%	0.66%
-low	0.28%	0.29%	0.30%	0.31%	0.32%	0.36%	0.40%	0.42%	0.44%	0.45%	0.45%
-medium	0.45%	0.47%	0.49%	0.51%	0.52%	0.58%	0.64%	0.67%	0.68%	0.68%	0.68%
-high	0.36%	0.42%	0.47%	0.51%	0.55%	0.65%	0.68%	0.65%	0.62%	0.64%	0.64%
Net wage rate	0.41%	0.44%	0.46%	0.48%	0.51%	0.58%	0.63%	0.64%	0.65%	0.66%	0.66%
-low	0.29%	0.30%	0.31%	0.32%	0.33%	0.36%	0.40%	0.43%	0.45%	0.46%	0.45%
-medium	0.45%	0.48%	0.50%	0.51%	0.53%	0.59%	0.64%	0.67%	0.69%	0.69%	0.69%
-high	0.37%	0.42%	0.47%	0.52%	0.55%	0.66%	0.69%	0.66%	0.63%	0.64%	0.64%
Effective Employment	0.24%	0.26%	0.27%	0.27%	0.28%	0.31%	0.33%	0.34%	0.34%	0.34%	0.34%
Average number of hours worked per worker	0.03%	0.03%	0.04%	0.04%	0.04%	0.05%	0.05%	0.06%	0.06%	0.06%	0.06%
Participation rate - 15-69 yrs. (change in pp)	0.05	0.05	0.05	0.05	0.06	0.06	0.07	0.07	0.07	0.07	0.07
-low	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.07	0.07	0.07
-medium	0.05	0.06	0.06	0.06	0.07	0.07	0.08	0.08	0.08	0.08	0.08
-high	0.03	0.02	0.02	0.02	0.02	0.02	0.04	0.04	0.05	0.04	0.04
Employment (no. of workers)	0.13%	0.14%	0.15%	0.15%	0.16%	0.18%	0.19%	0.20%	0.21%	0.21%	0.21%
-low	0.15%	0.16%	0.16%	0.17%	0.17%	0.17%	0.16%	0.14%	0.12%	0.11%	0.11%
-medium	0.14%	0.15%	0.16%	0.16%	0.17%	0.18%	0.19%	0.19%	0.20%	0.20%	0.20%
-high	0.08%	0.09%	0.10%	0.11%	0.12%	0.16%	0.23%	0.28%	0.31%	0.30%	0.30%
Unemployment rate (change in pp)	-0.06	-0.06	-0.06	-0.07	-0.07	-0.08	-0.08	-0.09	-0.09	-0.09	-0.09
-low	-0.07	-0.07	-0.07	-0.08	-0.08	-0.09	-0.09	-0.10	-0.10	-0.10	-0.10
-medium	-0.06	-0.06	-0.06	-0.07	-0.07	-0.08	-0.08	-0.09	-0.09	-0.09	-0.09
-high	-0.04	-0.04	-0.05	-0.05	-0.06	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
"Individual" Labour Productivity	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%
new persons - low	0.00%	-0.13%	-0.13%	-0.13%	-0.13%	-0.14%	-0.14%	-0.14%	-0.13%	-0.13%	-0.13%
new persons - medium	0.00%	-0.08%	-0.08%	-0.07%	-0.07%	-0.05%	-0.03%	-0.02%	-0.01%	-0.01%	-0.01%
new persons - high	0.00%	0.38%	0.37%	0.36%	0.35%	0.29%	0.22%	0.19%	0.17%	0.17%	0.17%
Degree of Self-Financing	43.30%	46.48%	49.28%	51.71%	53.76%	60.15%	62.67%	59.89%	52.02%	43.64%	42.64%

Table 67: Dynamic Impact of Training Subsidy, Poland

Training Subsidy Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.15%	0.19%	0.22%	0.24%	0.27%	0.34%	0.40%	0.44%	0.47%	0.48%	0.48%
Investment	0.89%	0.83%	0.78%	0.73%	0.70%	0.59%	0.57%	0.59%	0.62%	0.63%	0.63%
Consumption	0.58%	0.59%	0.61%	0.62%	0.63%	0.67%	0.71%	0.73%	0.74%	0.75%	0.75%
Gross wage rate (labour costs per hour)	0.25%	0.31%	0.36%	0.40%	0.44%	0.55%	0.62%	0.63%	0.64%	0.65%	0.65%
-low	0.11%	0.12%	0.14%	0.15%	0.16%	0.20%	0.24%	0.26%	0.29%	0.31%	0.31%
-medium	0.24%	0.27%	0.30%	0.32%	0.35%	0.43%	0.52%	0.57%	0.63%	0.64%	0.64%
-high	0.31%	0.40%	0.48%	0.55%	0.60%	0.75%	0.74%	0.67%	0.59%	0.61%	0.61%
Net wage rate	0.25%	0.31%	0.35%	0.39%	0.43%	0.54%	0.61%	0.62%	0.63%	0.64%	0.64%
-low	0.11%	0.13%	0.14%	0.16%	0.17%	0.21%	0.25%	0.27%	0.30%	0.31%	0.31%
-medium	0.24%	0.27%	0.30%	0.33%	0.35%	0.43%	0.52%	0.57%	0.63%	0.64%	0.64%
-high	0.31%	0.41%	0.48%	0.55%	0.60%	0.75%	0.75%	0.67%	0.59%	0.61%	0.61%
Effective Employment	0.19%	0.21%	0.23%	0.25%	0.26%	0.30%	0.34%	0.35%	0.37%	0.38%	0.38%
Average number of hours worked per worker	0.02%	0.03%	0.03%	0.03%	0.03%	0.04%	0.05%	0.05%	0.05%	0.05%	0.05%
Participation rate - 15-69 yrs. (change in pp)	0.04	0.05	0.06	0.06	0.07	0.08	0.09	0.10	0.11	0.11	0.11
-low	0.07	0.08	0.08	0.08	0.09	0.09	0.10	0.11	0.11	0.12	0.12
-medium	0.04	0.05	0.06	0.06	0.07	0.08	0.10	0.10	0.11	0.12	0.12
-high	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.06	0.07	0.06	0.06
Employment (no. of workers)	0.10%	0.12%	0.14%	0.15%	0.16%	0.20%	0.23%	0.25%	0.27%	0.28%	0.28%
-low	0.20%	0.21%	0.22%	0.22%	0.23%	0.25%	0.26%	0.26%	0.26%	0.25%	0.25%
-medium	0.10%	0.12%	0.13%	0.15%	0.16%	0.18%	0.18%	0.18%	0.19%	0.20%	0.20%
-high	0.07%	0.09%	0.11%	0.13%	0.15%	0.22%	0.34%	0.43%	0.50%	0.49%	0.49%
Unemployment rate (change in pp)	-0.03	-0.03	-0.04	-0.04	-0.05	-0.06	-0.07	-0.08	-0.08	-0.08	-0.08
-low	-0.05	-0.05	-0.05	-0.05	-0.06	-0.06	-0.07	-0.08	-0.08	-0.08	-0.08
-medium	-0.03	-0.03	-0.04	-0.04	-0.05	-0.06	-0.07	-0.08	-0.08	-0.09	-0.09
-high	-0.02	-0.03	-0.03	-0.04	-0.05	-0.06	-0.06	-0.06	-0.05	-0.05	-0.05
"Individual" Labour Productivity	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
new persons - low	0.00%	-0.06%	-0.06%	-0.07%	-0.07%	-0.07%	-0.08%	-0.08%	-0.09%	-0.09%	-0.09%
new persons - medium	0.00%	-0.17%	-0.17%	-0.17%	-0.17%	-0.15%	-0.13%	-0.11%	-0.10%	-0.09%	-0.09%
new persons - high	0.00%	0.58%	0.58%	0.57%	0.56%	0.52%	0.45%	0.40%	0.35%	0.34%	0.34%
Degree of Self-Financing	29.22%	33.23%	36.75%	39.72%	42.14%	48.93%	51.07%	48.56%	41.71%	33.46%	32.22%

Table 68: Dynamic Impact of Training Subsidy, United Kingdom

Training Subsidy Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.20%	0.23%	0.25%	0.27%	0.29%	0.35%	0.40%	0.42%	0.44%	0.44%	0.44%
Investment	0.89%	0.82%	0.76%	0.71%	0.67%	0.55%	0.51%	0.51%	0.52%	0.52%	0.52%
Consumption	0.62%	0.63%	0.65%	0.66%	0.67%	0.70%	0.75%	0.78%	0.80%	0.82%	0.82%
Gross wage rate (labour costs per hour)	0.40%	0.44%	0.48%	0.51%	0.53%	0.62%	0.67%	0.68%	0.69%	0.69%	0.69%
-low	0.37%	0.39%	0.40%	0.41%	0.42%	0.46%	0.50%	0.52%	0.55%	0.56%	0.55%
-medium	0.42%	0.45%	0.47%	0.49%	0.51%	0.58%	0.65%	0.68%	0.70%	0.69%	0.70%
-high	0.41%	0.48%	0.54%	0.58%	0.62%	0.73%	0.75%	0.72%	0.70%	0.71%	0.71%
Net wage rate	0.40%	0.44%	0.47%	0.50%	0.53%	0.61%	0.66%	0.67%	0.68%	0.68%	0.68%
-low	0.39%	0.41%	0.42%	0.43%	0.44%	0.48%	0.52%	0.55%	0.57%	0.58%	0.58%
-medium	0.43%	0.45%	0.48%	0.50%	0.51%	0.58%	0.65%	0.68%	0.70%	0.70%	0.70%
-high	0.41%	0.48%	0.54%	0.58%	0.62%	0.73%	0.75%	0.72%	0.70%	0.71%	0.71%
Effective Employment	0.29%	0.31%	0.32%	0.34%	0.35%	0.38%	0.40%	0.41%	0.42%	0.42%	0.42%
Average number of hours worked per worker	0.04%	0.04%	0.04%	0.04%	0.05%	0.05%	0.06%	0.06%	0.06%	0.06%	0.06%
Participation rate - 15-69 yrs. (change in pp)	0.06	0.07	0.07	0.08	0.08	0.09	0.09	0.10	0.11	0.11	0.11
-low	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.11	0.11	0.12	0.12
-medium	0.08	0.09	0.10	0.10	0.11	0.12	0.12	0.13	0.13	0.13	0.13
-high	0.04	0.04	0.04	0.04	0.04	0.05	0.06	0.07	0.07	0.07	0.07
Employment (no. of workers)	0.17%	0.18%	0.19%	0.20%	0.21%	0.23%	0.26%	0.27%	0.28%	0.28%	0.28%
-low	0.24%	0.25%	0.25%	0.26%	0.26%	0.26%	0.25%	0.24%	0.21%	0.20%	0.21%
-medium	0.18%	0.19%	0.20%	0.21%	0.22%	0.23%	0.23%	0.23%	0.24%	0.25%	0.25%
-high	0.10%	0.12%	0.14%	0.15%	0.17%	0.22%	0.29%	0.33%	0.37%	0.37%	0.36%
Unemployment rate (change in pp)	-0.07	-0.07	-0.08	-0.08	-0.09	-0.10	-0.11	-0.11	-0.11	-0.11	-0.11
-low	-0.11	-0.11	-0.12	-0.12	-0.12	-0.13	-0.14	-0.14	-0.15	-0.15	-0.15
-medium	-0.06	-0.07	-0.07	-0.07	-0.08	-0.09	-0.10	-0.11	-0.11	-0.11	-0.11
-high	-0.04	-0.05	-0.06	-0.06	-0.07	-0.08	-0.09	-0.09	-0.08	-0.08	-0.08
"Individual" Labour Productivity	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%
new persons - low	0.00%	-0.14%	-0.14%	-0.15%	-0.15%	-0.16%	-0.17%	-0.16%	-0.15%	-0.15%	-0.14%
new persons - medium	0.00%	-0.23%	-0.22%	-0.21%	-0.20%	-0.14%	-0.08%	-0.06%	-0.05%	-0.05%	-0.06%
new persons - high	0.00%	0.39%	0.38%	0.37%	0.36%	0.30%	0.23%	0.20%	0.18%	0.18%	0.17%
Degree of Self-Financing	30.42%	32.87%	34.98%	36.73%	38.15%	42.30%	44.51%	43.87%	40.49%	35.78%	34.97%

Table 69: Dynamic Impact of Training Subsidy, Belgium

Training Subsidy Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.16%	0.18%	0.19%	0.21%	0.22%	0.25%	0.29%	0.30%	0.32%	0.32%	0.32%
Investment	0.55%	0.52%	0.49%	0.46%	0.44%	0.39%	0.37%	0.38%	0.39%	0.38%	0.38%
Consumption	0.65%	0.65%	0.65%	0.65%	0.65%	0.64%	0.63%	0.62%	0.59%	0.57%	0.57%
Gross wage rate (labour costs per hour)	0.28%	0.31%	0.33%	0.36%	0.38%	0.44%	0.48%	0.48%	0.49%	0.50%	0.49%
-low	0.21%	0.22%	0.23%	0.24%	0.25%	0.29%	0.34%	0.37%	0.40%	0.40%	0.39%
-medium	0.30%	0.32%	0.33%	0.35%	0.36%	0.41%	0.47%	0.49%	0.49%	0.48%	0.49%
-high	0.30%	0.35%	0.39%	0.42%	0.45%	0.52%	0.52%	0.50%	0.49%	0.51%	0.51%
Net wage rate	0.28%	0.31%	0.33%	0.35%	0.37%	0.43%	0.47%	0.47%	0.48%	0.48%	0.48%
-low	0.22%	0.23%	0.24%	0.25%	0.26%	0.29%	0.34%	0.38%	0.41%	0.41%	0.39%
-medium	0.30%	0.32%	0.34%	0.35%	0.37%	0.42%	0.47%	0.49%	0.49%	0.49%	0.49%
-high	0.31%	0.35%	0.39%	0.42%	0.45%	0.53%	0.53%	0.51%	0.50%	0.52%	0.52%
Effective Employment	0.18%	0.19%	0.20%	0.21%	0.22%	0.24%	0.25%	0.26%	0.27%	0.27%	0.27%
Average number of hours worked per worker	0.02%	0.03%	0.03%	0.03%	0.03%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%
Participation rate - 15-69 yrs. (change in pp)	0.03	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.06	0.06	0.06
-low	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.06	0.06	0.06
-medium	0.04	0.04	0.05	0.05	0.06	0.06	0.06	0.06	0.07	0.06	0.06
-high	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.04	0.04	0.04	0.04
Employment (no. of workers)	0.09%	0.09%	0.10%	0.11%	0.11%	0.13%	0.14%	0.15%	0.16%	0.17%	0.16%
-low	0.11%	0.11%	0.12%	0.12%	0.12%	0.11%	0.08%	0.05%	0.02%	0.01%	0.02%
-medium	0.10%	0.11%	0.11%	0.12%	0.12%	0.13%	0.13%	0.14%	0.16%	0.17%	0.16%
-high	0.06%	0.07%	0.08%	0.09%	0.10%	0.13%	0.20%	0.24%	0.27%	0.26%	0.25%
Unemployment rate (change in pp)	-0.03	-0.04	-0.04	-0.04	-0.04	-0.05	-0.06	-0.06	-0.06	-0.06	-0.06
-low	-0.04	-0.04	-0.04	-0.05	-0.05	-0.06	-0.06	-0.07	-0.07	-0.07	-0.07
-medium	-0.04	-0.04	-0.04	-0.04	-0.05	-0.05	-0.06	-0.06	-0.06	-0.06	-0.06
-high	-0.02	-0.02	-0.03	-0.03	-0.03	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04
"Individual" Labour Productivity	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
new persons - low	0.00%	-0.22%	-0.22%	-0.23%	-0.23%	-0.24%	-0.23%	-0.21%	-0.20%	-0.19%	-0.17%
new persons - medium	0.00%	-0.21%	-0.19%	-0.17%	-0.15%	-0.06%	-0.01%	0.01%	0.02%	0.01%	0.00%
new persons - high	0.00%	0.43%	0.41%	0.39%	0.37%	0.28%	0.21%	0.17%	0.15%	0.16%	0.15%
Degree of Self-Financing	55.03%	58.77%	61.94%	64.58%	66.76%	72.81%	74.10%	71.61%	66.39%	61.99%	61.46%

Table 70: Dynamic Impact of Training Subsidy, Czech Republic

Training Subsidy Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.13%	0.16%	0.19%	0.21%	0.23%	0.30%	0.37%	0.40%	0.42%	0.42%	0.42%
Investment	0.79%	0.75%	0.72%	0.69%	0.66%	0.58%	0.54%	0.54%	0.54%	0.53%	0.53%
Consumption	0.61%	0.62%	0.63%	0.64%	0.65%	0.67%	0.70%	0.70%	0.69%	0.68%	0.68%
Gross wage rate (labour costs per hour)	0.33%	0.37%	0.40%	0.44%	0.46%	0.56%	0.64%	0.67%	0.68%	0.69%	0.68%
-low	0.16%	0.17%	0.19%	0.20%	0.21%	0.25%	0.30%	0.33%	0.37%	0.38%	0.38%
-medium	0.35%	0.38%	0.40%	0.42%	0.44%	0.53%	0.62%	0.66%	0.69%	0.69%	0.69%
-high	0.31%	0.39%	0.46%	0.52%	0.57%	0.72%	0.73%	0.67%	0.61%	0.63%	0.63%
Net wage rate	0.32%	0.36%	0.39%	0.42%	0.45%	0.55%	0.62%	0.64%	0.66%	0.66%	0.66%
-low	0.15%	0.17%	0.18%	0.20%	0.21%	0.25%	0.30%	0.33%	0.36%	0.38%	0.38%
-medium	0.35%	0.38%	0.40%	0.42%	0.44%	0.53%	0.62%	0.66%	0.69%	0.69%	0.69%
-high	0.31%	0.39%	0.46%	0.52%	0.57%	0.72%	0.74%	0.67%	0.62%	0.63%	0.63%
Effective Employment	0.20%	0.22%	0.24%	0.25%	0.26%	0.30%	0.33%	0.35%	0.36%	0.36%	0.36%
Average number of hours worked per worker	0.03%	0.03%	0.03%	0.03%	0.04%	0.05%	0.05%	0.06%	0.06%	0.06%	0.06%
Participation rate - 15-69 yrs. (change in pp)	0.04	0.05	0.05	0.06	0.06	0.07	0.08	0.09	0.09	0.09	0.09
-low	0.03	0.03	0.04	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07
-medium	0.04	0.05	0.06	0.07	0.07	0.08	0.09	0.10	0.10	0.10	0.10
-high	0.03	0.03	0.03	0.02	0.02	0.02	0.04	0.05	0.06	0.06	0.06
Employment (no. of workers)	0.09%	0.10%	0.12%	0.13%	0.14%	0.16%	0.19%	0.20%	0.21%	0.22%	0.22%
-low	0.09%	0.09%	0.10%	0.11%	0.11%	0.12%	0.11%	0.10%	0.07%	0.05%	0.06%
-medium	0.10%	0.11%	0.12%	0.13%	0.14%	0.16%	0.17%	0.18%	0.18%	0.19%	0.19%
-high	0.05%	0.07%	0.09%	0.11%	0.12%	0.19%	0.29%	0.36%	0.41%	0.41%	0.40%
Unemployment rate (change in pp)	-0.03	-0.03	-0.03	-0.04	-0.04	-0.05	-0.06	-0.07	-0.07	-0.07	-0.07
-low	-0.03	-0.03	-0.03	-0.03	-0.04	-0.04	-0.05	-0.06	-0.06	-0.06	-0.06
-medium	-0.03	-0.03	-0.04	-0.04	-0.04	-0.05	-0.06	-0.07	-0.07	-0.07	-0.07
-high	-0.01	-0.02	-0.03	-0.03	-0.04	-0.05	-0.05	-0.05	-0.04	-0.04	-0.04
"Individual" Labour Productivity	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%
new persons - low	0.00%	-0.14%	-0.14%	-0.15%	-0.15%	-0.15%	-0.16%	-0.16%	-0.16%	-0.16%	-0.16%
new persons - medium	0.00%	-0.12%	-0.11%	-0.11%	-0.11%	-0.08%	-0.06%	-0.04%	-0.04%	-0.04%	-0.04%
new persons - high	0.00%	0.64%	0.63%	0.61%	0.60%	0.50%	0.36%	0.30%	0.26%	0.28%	0.27%
Degree of Self-Financing	33.41%	37.15%	40.50%	43.36%	45.78%	53.46%	57.99%	57.43%	54.11%	50.42%	49.94%

Table 71: Dynamic Impact of Training Subsidy, Spain

Training Subsidy Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.18%	0.22%	0.26%	0.29%	0.32%	0.43%	0.54%	0.60%	0.66%	0.70%	0.70%
Investment	1.02%	0.98%	0.94%	0.91%	0.88%	0.80%	0.78%	0.80%	0.83%	0.85%	0.84%
Consumption	0.68%	0.69%	0.71%	0.73%	0.75%	0.81%	0.91%	0.98%	1.06%	1.13%	1.14%
Gross wage rate (labour costs per hour)	0.42%	0.48%	0.54%	0.59%	0.63%	0.78%	0.89%	0.92%	0.94%	0.96%	0.96%
-low	0.31%	0.33%	0.35%	0.37%	0.39%	0.46%	0.55%	0.60%	0.65%	0.67%	0.66%
-medium	0.56%	0.59%	0.63%	0.66%	0.69%	0.82%	0.95%	1.01%	1.03%	1.02%	1.03%
-high	0.48%	0.58%	0.67%	0.75%	0.81%	1.02%	1.09%	1.06%	1.02%	1.05%	1.05%
Net wage rate	0.42%	0.48%	0.53%	0.58%	0.62%	0.76%	0.86%	0.89%	0.91%	0.93%	0.93%
-low	0.32%	0.35%	0.37%	0.39%	0.41%	0.48%	0.57%	0.62%	0.67%	0.69%	0.68%
-medium	0.57%	0.61%	0.65%	0.68%	0.71%	0.83%	0.97%	1.03%	1.05%	1.05%	1.05%
-high	0.49%	0.59%	0.68%	0.76%	0.82%	1.03%	1.11%	1.07%	1.03%	1.06%	1.07%
Effective Employment	0.33%	0.35%	0.37%	0.39%	0.40%	0.44%	0.49%	0.51%	0.53%	0.54%	0.54%
Average number of hours worked per worker	0.04%	0.05%	0.05%	0.05%	0.06%	0.07%	0.08%	0.08%	0.08%	0.08%	0.08%
Participation rate - 15-69 yrs. (change in pp)	0.07	0.07	0.08	0.08	0.08	0.09	0.10	0.11	0.13	0.13	0.13
-low	0.08	0.08	0.08	0.09	0.09	0.10	0.11	0.11	0.13	0.15	0.15
-medium	0.09	0.10	0.11	0.12	0.12	0.14	0.14	0.15	0.16	0.16	0.16
-high	0.05	0.04	0.04	0.04	0.04	0.03	0.06	0.08	0.09	0.09	0.09
Employment (no. of workers)	0.22%	0.24%	0.25%	0.26%	0.27%	0.31%	0.35%	0.38%	0.42%	0.43%	0.43%
-low	0.25%	0.26%	0.27%	0.27%	0.28%	0.28%	0.26%	0.24%	0.22%	0.22%	0.23%
-medium	0.27%	0.29%	0.30%	0.32%	0.32%	0.34%	0.36%	0.39%	0.44%	0.49%	0.48%
-high	0.15%	0.17%	0.20%	0.22%	0.24%	0.33%	0.48%	0.59%	0.69%	0.69%	0.69%
Unemployment rate (change in pp)	-0.10	-0.11	-0.12	-0.13	-0.13	-0.16	-0.18	-0.19	-0.20	-0.20	-0.20
-low	-0.11	-0.12	-0.13	-0.13	-0.14	-0.15	-0.18	-0.19	-0.20	-0.21	-0.21
-medium	-0.13	-0.13	-0.14	-0.15	-0.15	-0.18	-0.20	-0.21	-0.22	-0.22	-0.22
-high	-0.07	-0.09	-0.10	-0.11	-0.12	-0.14	-0.15	-0.15	-0.15	-0.15	-0.15
"Individual" Labour Productivity	0.11%	0.11%	0.11%	0.11%	0.11%	0.11%	0.11%	0.10%	0.10%	0.10%	0.10%
new persons - low	0.00%	-0.28%	-0.28%	-0.29%	-0.29%	-0.30%	-0.29%	-0.28%	-0.26%	-0.25%	-0.24%
new persons - medium	0.00%	-0.49%	-0.44%	-0.39%	-0.35%	-0.19%	-0.05%	0.00%	0.03%	0.00%	0.00%
new persons - high	0.00%	0.82%	0.78%	0.76%	0.73%	0.62%	0.52%	0.45%	0.40%	0.40%	0.39%
Degree of Self-Financing	31.03%	35.13%	38.77%	41.98%	44.75%	53.67%	57.25%	52.79%	40.55%	28.35%	27.07%

Table 72: Dynamic Impact of Training Subsidy, Finland

Training Subsidy Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.15%	0.18%	0.21%	0.23%	0.25%	0.30%	0.35%	0.37%	0.38%	0.38%	0.38%
Investment	0.78%	0.72%	0.67%	0.62%	0.59%	0.49%	0.47%	0.48%	0.49%	0.49%	0.49%
Consumption	0.68%	0.69%	0.70%	0.71%	0.72%	0.74%	0.75%	0.76%	0.75%	0.74%	0.74%
Gross wage rate (labour costs per hour)	0.30%	0.36%	0.41%	0.45%	0.48%	0.59%	0.64%	0.65%	0.66%	0.67%	0.66%
-low	0.26%	0.28%	0.30%	0.31%	0.32%	0.37%	0.43%	0.48%	0.52%	0.52%	0.51%
-medium	0.34%	0.37%	0.39%	0.42%	0.44%	0.51%	0.59%	0.64%	0.66%	0.65%	0.66%
-high	0.30%	0.39%	0.46%	0.52%	0.57%	0.70%	0.71%	0.67%	0.65%	0.67%	0.66%
Net wage rate	0.30%	0.36%	0.41%	0.44%	0.48%	0.58%	0.63%	0.64%	0.65%	0.65%	0.65%
-low	0.27%	0.29%	0.31%	0.32%	0.33%	0.38%	0.44%	0.48%	0.53%	0.53%	0.52%
-medium	0.34%	0.37%	0.40%	0.42%	0.44%	0.51%	0.60%	0.64%	0.67%	0.66%	0.66%
-high	0.30%	0.39%	0.46%	0.52%	0.57%	0.70%	0.72%	0.68%	0.65%	0.67%	0.67%
Effective Employment	0.20%	0.22%	0.24%	0.25%	0.26%	0.29%	0.31%	0.32%	0.33%	0.33%	0.33%
Average number of hours worked per worker	0.02%	0.03%	0.03%	0.04%	0.04%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%
Participation rate - 15-69 yrs. (change in pp)	0.03	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.06	0.06	0.06
-low	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.06	0.07	0.07
-medium	0.03	0.04	0.05	0.05	0.06	0.06	0.06	0.06	0.07	0.07	0.07
-high	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.04	0.05	0.04	0.04
Employment (no. of workers)	0.10%	0.11%	0.12%	0.13%	0.14%	0.16%	0.18%	0.19%	0.21%	0.21%	0.21%
-low	0.13%	0.14%	0.14%	0.14%	0.14%	0.13%	0.09%	0.05%	0.00%	0.00%	0.02%
-medium	0.12%	0.13%	0.14%	0.15%	0.15%	0.16%	0.15%	0.14%	0.16%	0.17%	0.16%
-high	0.06%	0.08%	0.10%	0.11%	0.13%	0.18%	0.26%	0.31%	0.35%	0.34%	0.34%
Unemployment rate (change in pp)	-0.05	-0.06	-0.06	-0.07	-0.08	-0.09	-0.10	-0.11	-0.11	-0.11	-0.11
-low	-0.07	-0.07	-0.08	-0.08	-0.08	-0.09	-0.11	-0.12	-0.13	-0.13	-0.12
-medium	-0.06	-0.07	-0.07	-0.08	-0.08	-0.10	-0.11	-0.12	-0.13	-0.12	-0.13
-high	-0.03	-0.04	-0.05	-0.06	-0.06	-0.08	-0.09	-0.08	-0.08	-0.08	-0.08
"Individual" Labour Productivity	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%
new persons - low	0.00%	-0.28%	-0.29%	-0.29%	-0.30%	-0.32%	-0.32%	-0.30%	-0.26%	-0.25%	-0.23%
new persons - medium	0.00%	-0.27%	-0.26%	-0.25%	-0.24%	-0.18%	-0.10%	-0.07%	-0.05%	-0.06%	-0.07%
new persons - high	0.00%	0.46%	0.45%	0.45%	0.44%	0.38%	0.27%	0.22%	0.19%	0.20%	0.20%
Degree of Self-Financing	42.11%	47.04%	51.13%	54.47%	57.15%	64.19%	64.74%	60.71%	52.27%	43.68%	42.66%

Table 73: Dynamic Impact of Training Subsidy, France

Training Subsidy Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.20%	0.23%	0.25%	0.27%	0.29%	0.35%	0.39%	0.41%	0.42%	0.42%	0.42%
Investment	0.83%	0.77%	0.71%	0.67%	0.63%	0.51%	0.44%	0.44%	0.44%	0.44%	0.44%
Consumption	0.54%	0.55%	0.56%	0.57%	0.58%	0.63%	0.70%	0.75%	0.82%	0.86%	0.87%
Gross wage rate (labour costs per hour)	0.43%	0.48%	0.52%	0.55%	0.58%	0.67%	0.73%	0.74%	0.74%	0.74%	0.74%
-low	0.50%	0.52%	0.53%	0.54%	0.55%	0.57%	0.59%	0.60%	0.60%	0.59%	0.59%
-medium	0.53%	0.56%	0.58%	0.60%	0.62%	0.69%	0.76%	0.80%	0.82%	0.81%	0.81%
-high	0.41%	0.49%	0.56%	0.61%	0.66%	0.79%	0.84%	0.81%	0.78%	0.79%	0.79%
Net wage rate	0.46%	0.51%	0.55%	0.58%	0.61%	0.69%	0.75%	0.76%	0.76%	0.76%	0.75%
-low	0.59%	0.61%	0.62%	0.63%	0.64%	0.66%	0.68%	0.69%	0.69%	0.69%	0.68%
-medium	0.56%	0.58%	0.61%	0.63%	0.65%	0.72%	0.79%	0.82%	0.84%	0.84%	0.84%
-high	0.42%	0.50%	0.56%	0.62%	0.66%	0.80%	0.84%	0.82%	0.79%	0.80%	0.80%
Effective Employment	0.36%	0.37%	0.38%	0.39%	0.40%	0.43%	0.44%	0.44%	0.44%	0.44%	0.43%
Average number of hours worked per worker	0.03%	0.04%	0.04%	0.05%	0.05%	0.06%	0.06%	0.06%	0.07%	0.07%	0.07%
Participation rate - 15-69 yrs. (change in pp)	0.09	0.10	0.10	0.10	0.11	0.11	0.12	0.12	0.12	0.12	0.12
-low	0.19	0.19	0.19	0.19	0.19	0.20	0.20	0.21	0.21	0.21	0.21
-medium	0.07	0.08	0.09	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.11
-high	0.03	0.03	0.03	0.03	0.03	0.04	0.05	0.05	0.06	0.05	0.05
Employment (no. of workers)	0.30%	0.31%	0.32%	0.32%	0.33%	0.35%	0.37%	0.37%	0.38%	0.38%	0.38%
-low	0.62%	0.63%	0.63%	0.64%	0.64%	0.66%	0.66%	0.66%	0.66%	0.66%	0.66%
-medium	0.24%	0.25%	0.25%	0.26%	0.27%	0.27%	0.26%	0.26%	0.25%	0.26%	0.26%
-high	0.09%	0.11%	0.12%	0.13%	0.14%	0.19%	0.25%	0.28%	0.31%	0.30%	0.30%
Unemployment rate (change in pp)	-0.14	-0.14	-0.15	-0.15	-0.15	-0.16	-0.17	-0.17	-0.17	-0.17	-0.17
-low	-0.27	-0.27	-0.28	-0.28	-0.28	-0.29	-0.29	-0.30	-0.30	-0.30	-0.30
-medium	-0.12	-0.12	-0.12	-0.13	-0.13	-0.14	-0.15	-0.15	-0.16	-0.16	-0.16
-high	-0.05	-0.05	-0.06	-0.06	-0.07	-0.08	-0.09	-0.09	-0.08	-0.08	-0.08
"Individual" Labour Productivity	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.09%	0.08%	0.08%	0.08%
new persons - low	0.00%	0.00%	-0.01%	-0.01%	-0.01%	-0.02%	-0.03%	-0.03%	-0.03%	-0.03%	-0.02%
new persons - medium	0.00%	-0.19%	-0.18%	-0.18%	-0.17%	-0.14%	-0.10%	-0.09%	-0.07%	-0.07%	-0.07%
new persons - high	0.00%	0.27%	0.27%	0.27%	0.26%	0.23%	0.18%	0.16%	0.14%	0.13%	0.13%
Degree of Self-Financing	39.75%	43.42%	46.66%	49.48%	51.88%	59.14%	61.65%	58.18%	48.90%	40.32%	39.69%

Table 74: Dynamic Impact of Training Subsidy, Netherlands

Training Subsidy Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.17%	0.20%	0.22%	0.23%	0.25%	0.30%	0.34%	0.35%	0.37%	0.37%	0.37%
Investment	0.75%	0.69%	0.65%	0.61%	0.57%	0.46%	0.41%	0.40%	0.41%	0.41%	0.40%
Consumption	0.59%	0.60%	0.61%	0.62%	0.63%	0.65%	0.68%	0.70%	0.71%	0.72%	0.72%
Gross wage rate (labour costs per hour)	0.37%	0.41%	0.44%	0.47%	0.49%	0.57%	0.63%	0.64%	0.64%	0.65%	0.65%
-low	0.40%	0.41%	0.43%	0.44%	0.45%	0.49%	0.53%	0.56%	0.57%	0.57%	0.55%
-medium	0.46%	0.49%	0.51%	0.52%	0.54%	0.59%	0.64%	0.66%	0.67%	0.68%	0.68%
-high	0.30%	0.36%	0.41%	0.45%	0.49%	0.60%	0.65%	0.64%	0.63%	0.64%	0.64%
Net wage rate	0.38%	0.41%	0.44%	0.47%	0.49%	0.57%	0.62%	0.63%	0.63%	0.64%	0.64%
-low	0.44%	0.45%	0.46%	0.47%	0.48%	0.52%	0.57%	0.59%	0.61%	0.61%	0.59%
-medium	0.47%	0.49%	0.51%	0.53%	0.55%	0.60%	0.65%	0.66%	0.68%	0.68%	0.69%
-high	0.31%	0.37%	0.42%	0.46%	0.50%	0.61%	0.66%	0.65%	0.63%	0.65%	0.65%
Effective Employment	0.26%	0.28%	0.29%	0.30%	0.30%	0.33%	0.34%	0.35%	0.36%	0.36%	0.36%
Average number of hours worked per worker	0.04%	0.04%	0.04%	0.04%	0.05%	0.05%	0.06%	0.06%	0.06%	0.06%	0.06%
Participation rate - 15-69 yrs. (change in pp)	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06
-low	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.09	0.08
-medium	0.04	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.07	0.07
-high	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.04	0.04	0.04	0.04
Employment (no. of workers)	0.15%	0.16%	0.17%	0.18%	0.18%	0.20%	0.21%	0.22%	0.23%	0.23%	0.23%
-low	0.24%	0.24%	0.24%	0.25%	0.25%	0.24%	0.21%	0.19%	0.18%	0.19%	0.21%
-medium	0.16%	0.16%	0.17%	0.18%	0.18%	0.20%	0.21%	0.21%	0.23%	0.23%	0.22%
-high	0.08%	0.09%	0.11%	0.12%	0.13%	0.17%	0.22%	0.26%	0.28%	0.28%	0.27%
Unemployment rate (change in pp)	-0.09	-0.09	-0.10	-0.10	-0.11	-0.12	-0.13	-0.13	-0.14	-0.14	-0.13
-low	-0.13	-0.14	-0.14	-0.14	-0.15	-0.16	-0.17	-0.17	-0.18	-0.18	-0.17
-medium	-0.09	-0.09	-0.10	-0.10	-0.10	-0.11	-0.12	-0.13	-0.13	-0.13	-0.13
-high	-0.05	-0.06	-0.07	-0.07	-0.08	-0.10	-0.11	-0.11	-0.11	-0.11	-0.11
"Individual" Labour Productivity	0.09%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.09%	0.10%	0.10%
new persons - low	0.00%	-0.16%	-0.17%	-0.18%	-0.19%	-0.21%	-0.20%	-0.17%	-0.14%	-0.14%	-0.10%
new persons - medium	0.00%	-0.08%	-0.07%	-0.06%	-0.05%	-0.02%	0.00%	0.01%	0.00%	0.00%	-0.01%
new persons - high	0.00%	0.23%	0.22%	0.21%	0.21%	0.19%	0.16%	0.13%	0.11%	0.11%	0.10%
Degree of Self-Financing	47.36%	50.69%	53.54%	55.95%	57.98%	64.06%	66.32%	64.21%	58.65%	53.00%	51.86%

Table 75: Dynamic Impact of Training Subsidy, Sweden

Training Subsidy Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.17%	0.20%	0.22%	0.23%	0.25%	0.29%	0.32%	0.34%	0.36%	0.36%	0.35%
Investment	0.68%	0.64%	0.59%	0.56%	0.53%	0.45%	0.43%	0.45%	0.47%	0.47%	0.45%
Consumption	0.66%	0.67%	0.68%	0.68%	0.69%	0.70%	0.71%	0.71%	0.70%	0.69%	0.68%
Gross wage rate (labour costs per hour)	0.37%	0.41%	0.44%	0.46%	0.49%	0.55%	0.59%	0.60%	0.60%	0.61%	0.61%
-low	0.24%	0.27%	0.30%	0.32%	0.34%	0.42%	0.54%	0.62%	0.64%	0.56%	0.51%
-medium	0.38%	0.40%	0.42%	0.44%	0.45%	0.48%	0.51%	0.52%	0.54%	0.57%	0.58%
-high	0.41%	0.46%	0.51%	0.55%	0.58%	0.67%	0.67%	0.62%	0.59%	0.63%	0.63%
Net wage rate	0.36%	0.40%	0.43%	0.45%	0.47%	0.53%	0.57%	0.57%	0.58%	0.59%	0.59%
-low	0.25%	0.28%	0.30%	0.32%	0.34%	0.41%	0.54%	0.62%	0.65%	0.58%	0.52%
-medium	0.39%	0.41%	0.43%	0.44%	0.45%	0.49%	0.51%	0.53%	0.55%	0.57%	0.58%
-high	0.41%	0.47%	0.51%	0.55%	0.58%	0.67%	0.67%	0.63%	0.59%	0.63%	0.64%
Effective Employment	0.22%	0.23%	0.24%	0.25%	0.26%	0.28%	0.29%	0.30%	0.30%	0.31%	0.31%
Average number of hours worked per worker	0.03%	0.03%	0.04%	0.04%	0.04%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%
Participation rate - 15-69 yrs. (change in pp)	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.06	0.07	0.07	0.07
-low	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.06	0.09	0.10	0.09
-medium	0.05	0.05	0.05	0.05	0.05	0.06	0.07	0.07	0.07	0.07	0.07
-high	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.04	0.05	0.05	0.05
Employment (no. of workers)	0.11%	0.12%	0.13%	0.13%	0.14%	0.16%	0.17%	0.19%	0.21%	0.21%	0.20%
-low	0.13%	0.12%	0.10%	0.09%	0.08%	0.02%	-0.11%	-0.20%	-0.24%	-0.15%	-0.08%
-medium	0.12%	0.13%	0.14%	0.15%	0.16%	0.19%	0.21%	0.23%	0.25%	0.24%	0.21%
-high	0.09%	0.10%	0.12%	0.13%	0.14%	0.18%	0.27%	0.33%	0.38%	0.34%	0.32%
Unemployment rate (change in pp)	-0.06	-0.06	-0.07	-0.07	-0.08	-0.09	-0.10	-0.10	-0.10	-0.10	-0.10
-low	-0.06	-0.07	-0.08	-0.08	-0.09	-0.11	-0.13	-0.14	-0.14	-0.14	-0.12
-medium	-0.06	-0.06	-0.07	-0.07	-0.07	-0.08	-0.08	-0.08	-0.09	-0.09	-0.09
-high	-0.04	-0.05	-0.06	-0.07	-0.07	-0.08	-0.09	-0.08	-0.08	-0.08	-0.08
"Individual" Labour Productivity	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.08%	0.09%	0.09%
new persons - low	0.00%	-1.51%	-1.26%	-1.11%	-1.01%	-0.89%	-0.74%	-0.61%	-0.46%	-0.43%	-0.34%
new persons - medium	0.00%	0.30%	0.21%	0.14%	0.11%	0.07%	0.08%	0.07%	0.05%	0.04%	0.02%
new persons - high	0.00%	0.44%	0.44%	0.44%	0.44%	0.41%	0.32%	0.25%	0.19%	0.19%	0.18%
Degree of Self-Financing	58.89%	62.66%	65.87%	68.48%	70.56%	76.00%	76.43%	73.02%	65.86%	57.96%	55.72%

Table 76: Dynamic Impact of Training Subsidy, Slovakia

Training Subsidy Reform / Years after reform	1	2	3	4	5	10	20	30	50	100	Steady State
GDP	0.13%	0.16%	0.19%	0.21%	0.24%	0.31%	0.39%	0.43%	0.45%	0.45%	0.45%
Investment	0.86%	0.82%	0.78%	0.75%	0.72%	0.64%	0.60%	0.60%	0.59%	0.59%	0.58%
Consumption	0.58%	0.60%	0.61%	0.62%	0.63%	0.66%	0.70%	0.72%	0.73%	0.74%	0.74%
Gross wage rate (labour costs per hour)	0.30%	0.35%	0.39%	0.42%	0.46%	0.57%	0.65%	0.67%	0.69%	0.69%	0.69%
-low	0.12%	0.14%	0.15%	0.16%	0.17%	0.22%	0.27%	0.31%	0.34%	0.35%	0.35%
-medium	0.30%	0.33%	0.36%	0.39%	0.41%	0.50%	0.61%	0.66%	0.69%	0.69%	0.69%
-high	0.34%	0.43%	0.51%	0.58%	0.63%	0.79%	0.77%	0.68%	0.64%	0.66%	0.66%
Net wage rate	0.30%	0.35%	0.38%	0.42%	0.45%	0.56%	0.64%	0.66%	0.68%	0.68%	0.68%
-low	0.12%	0.14%	0.15%	0.16%	0.17%	0.22%	0.27%	0.31%	0.34%	0.35%	0.35%
-medium	0.30%	0.33%	0.36%	0.39%	0.41%	0.50%	0.61%	0.66%	0.69%	0.69%	0.69%
-high	0.35%	0.44%	0.51%	0.58%	0.64%	0.79%	0.77%	0.69%	0.64%	0.67%	0.66%
Effective Employment	0.20%	0.22%	0.23%	0.25%	0.26%	0.30%	0.33%	0.35%	0.37%	0.37%	0.37%
Average number of hours worked per worker	0.02%	0.03%	0.03%	0.03%	0.04%	0.05%	0.05%	0.06%	0.06%	0.06%	0.06%
Participation rate - 15-69 yrs. (change in pp)	0.04	0.04	0.05	0.05	0.05	0.06	0.08	0.08	0.09	0.09	0.09
-low	0.02	0.02	0.03	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06
-medium	0.04	0.05	0.06	0.06	0.07	0.08	0.09	0.10	0.10	0.10	0.10
-high	0.03	0.02	0.02	0.02	0.01	0.01	0.03	0.05	0.06	0.05	0.05
Employment (no. of workers)	0.08%	0.10%	0.11%	0.12%	0.13%	0.16%	0.19%	0.21%	0.22%	0.23%	0.22%
-low	0.07%	0.08%	0.08%	0.09%	0.10%	0.11%	0.11%	0.09%	0.07%	0.05%	0.05%
-medium	0.09%	0.11%	0.12%	0.13%	0.13%	0.15%	0.16%	0.17%	0.18%	0.18%	0.18%
-high	0.05%	0.07%	0.09%	0.11%	0.12%	0.20%	0.33%	0.41%	0.46%	0.45%	0.45%
Unemployment rate (change in pp)	-0.02	-0.03	-0.03	-0.04	-0.04	-0.05	-0.06	-0.07	-0.07	-0.07	-0.07
-low	-0.01	-0.02	-0.02	-0.02	-0.02	-0.03	-0.04	-0.04	-0.05	-0.05	-0.05
-medium	-0.03	-0.03	-0.03	-0.04	-0.04	-0.05	-0.06	-0.07	-0.07	-0.07	-0.07
-high	-0.01	-0.02	-0.02	-0.03	-0.03	-0.05	-0.05	-0.04	-0.03	-0.04	-0.04
"Individual" Labour Productivity	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%
new persons - low	0.00%	-0.14%	-0.14%	-0.14%	-0.15%	-0.15%	-0.16%	-0.17%	-0.17%	-0.17%	-0.16%
new persons - medium	0.00%	-0.17%	-0.16%	-0.15%	-0.15%	-0.11%	-0.07%	-0.05%	-0.05%	-0.05%	-0.05%
new persons - high	0.00%	0.88%	0.85%	0.82%	0.79%	0.62%	0.43%	0.35%	0.31%	0.33%	0.33%
Degree of Self-Financing	25.47%	28.59%	31.36%	33.75%	35.79%	42.23%	45.17%	43.08%	36.23%	27.78%	26.72%

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