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The Philippines Employment Projections Model: Employment targeting and scenarios

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Preface

The primary goal of the ILO is to contribute, with member States, to achieve full and productive employment and decent work for all, including women and young people, a goal embedded in the ILO Declaration on Social Justice for a Fair Globalization (2008),[1] and which has now been widely adopted by the international community. The integrated approach to do this was further reaffirmed by the 2010 Resolution concerning employment policies for social justice and a fair globalization.[2]

In order to support member States and the social partners to reach this goal, the ILO pursues a Decent Work Agenda which comprises four interrelated areas: Respect for fundamental worker's rights and international labour standards, employment promotion, social protection and social dialogue. Explanations and elaborations of this integrated approach and related challenges are contained in a number of key documents: in those explaining the concept of decent work,[3] in the Employment Policy Convention, 1964 (No. 122), in the Global Employment Agenda and, as applied to crisis response, in the Global Jobs Pact adopted by the 2009 International Labour Conference in the aftermath of the 2008 global economic crisis.

The Employment Sector is fully engaged in supporting countries placing employment at the centre of their economic and social policies, using these complementary frameworks, and is doing so through a large range of technical support and capacity building activities, policy advisory services and policy research. As part of its research and publications programme, the Employment Sector promotes knowledge-generation around key policy issues and topics conforming to the core elements of the Global Employment Agenda and the Decent Work Agenda. The Sector's publications consist of books, monographs, working papers, employment reports and policy briefs.

The Employment Working Papers series is designed to disseminate the main findings of research initiatives undertaken by the various departments and programmes of the Sector. The working papers are intended to encourage exchange of ideas and to stimulate debate. The views expressed are the responsibility of the author(s) and do not necessarily represent those of the ILO.

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Employment Sector

[1] See http://www.ilo.org/public/english/bureau/dgo/download/dg_announce_en.pdf.

[2] See http://www.ilo.org/public/libdoc/ilo/2010/110B09_108_engl.pdf.

[3] See the successive Reports of the Director-General to the International Labour Conference: *Decent work* (1999); *Reducing the decent work deficit: A global challenge* (2001); *Working out of poverty* (2003).

Acknowledgements

The ILO Employment Trends team has worked in collaboration with Inforum (University of Maryland) to develop employment projection models for a number of developing countries. The development of the Philippines Employment Projections Model is based on the ILO Trends – Inforum methodology and was commissioned by the ILO Country Office for the Philippines in September 2010. The initial version of the model was presented during a workshop held in Manila in November 2010, and has subsequently been updated and expanded. The version of the model presented in this paper was completed in May 2012.

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Abbreviations

BLES	Bureau for Labour and Employment Statistics
BPO	business process outsourcing
DOLE	Department of Labour and Employment
DTI	Department of Trade and Industry
EAPEP	Economically Active Population and Estimates
EPMs	employment projection models
EPR	employment-to-population ratio
FIES	Family Income and Expenditure Survey
GDP	Gross Domestic Product
ICT	information and communication technology
IPP	Investment Priorities Plan
LFPR	labour force participation rate
LFS	Labour Force Survey
LMIA	labour market information and analysis
LP	labour productivity
MDG	Millennium Development Goal
NEDA	National Economic Development Authority
NSCB	National Statistical Coordination Bureau
OFW	overseas Filipino workers
PDP	Philippines Development Plan
PEPM	Philippines Employment Projections Model
PEDP	Philippines Export Development Plan
PHP	Philippines peso
PSIC	Philippines Standard Industrial Classification System
UR	unemployment rate
VER	vulnerable employment rate
WP	working poverty
WPR1	working poverty rate (1.25$/day)
WPR2	working poverty rate (2$/day)

Abstract

Employment projection models (EPMs) are important analytical tools to be used in strategic planning and policymaking, as they allow for a comprehensive analysis of the labour market in its broader economic context. They also serve a consistent analytical framework for an assessment of the effects policy scenarios including employment targeting.

This working paper illustrates the potential and applications of EPMs, building on the Philippines Employment Projection Model (PEPM). PEPM is an example of EPMs that have been built with support from the ILO as well as Inforum for Ukraine, Mongolia, Peru and Viet Nam, which are based on an interindustry input-output structure. The paper describes the main features of the model, and provides an analysis of the results (mid-term employment projections), given the baseline assumptions.

The paper details how the model can be used to provide information on employment targeting, in particular based on the MDG employment indicators, which capture both the volume and (measures of) the quality of employment. The paper also illustrates the use of the model to assess structural and sectoral change, fiscal policy and skills mismatch, which is facilitated by the interindustry nature of the model.

Strong points of the PEPM include its ability to accommodate changes in assumptions to produce alternative scenarios, as well as the level of detail that is available in the sectoral and occupational projections. The paper concludes with a number of suggested extensions of the model, including the disaggregation of employment data by gender, region, and/or urban/rural area. Additional efforts can be made to improve the linkages between skills mismatch, productivity and growth.

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Introduction

Employment targeting or setting employment targets as development objectives has become increasingly relevant in the aftermath of the recent global economic crisis. Developed and developing countries alike have found themselves confronted with the pressing challenge of reviving their economies and/or ensuring that output growth is accompanied by sufficient productive employment opportunities. Furthermore, the ongoing Euro zone crisis and concerns about the debt levels of many countries have raised the additional challenge of balancing economic growth and job creation on the one hand with austerity policies and debt reduction on the other. In a number of countries, achieving these objectives simultaneously has proven to be quite difficult, and a trade-off between the two sets of objectives has seen politicians confronted with mass protests and social unrest.

Setting employment outcomes as policy objectives and monitoring progress towards achieving them is an essential part of policies to mitigate the social impacts of the ongoing crises as well as broader development policies. Monitoring strategies for employment targets require effective labour market information and analysis (LMIA) systems and the methodologies that can be used are linked to the level of development of these systems (Sparreboom, 2013). For instance, at least three methods can be used to measure progress on the Millennium Development Goal (MDG) target of halving poverty (working poverty) by 2015, each of which has advantages and drawbacks in terms of data and resource requirements, analytical potential, etc. The first approach, linked with a first level LMIA system, involves a direct extrapolation of working poverty trends, without accounting for economic growth or other factors. A second approach, linked with a first or second level LMIA system, takes into account the interplay between economic factors and labour market outcomes. This approach is based on the concept of employment elasticity of growth, and can give an economic growth target that would need to be achieved in order to reach the working poverty reduction target. A third method, associated with a third level LMIA system involves the use of econometric or employment projection models (EPMs). It is the latter method that is the focus of this paper.

EPMs are important analytical tools to be used in strategic planning and policymaking, as they allow for a comprehensive analysis of the labour market in its broader economic context. For instance, they allow analysing the labour market impacts of exogenous shocks such as a decline in foreign direct investment or an export shock, or of changes in fiscal or economic policies, such as increased government spending or implementation of austerity measures, or export promotion policies. Because the models explicitly account for the inter-industry linkages within each economy, they can be used to analyse the impact that increased demand for the product of one industry has on other industries (spill-over effects in terms of output growth and/or employment growth). They are therefore particularly useful in assessing structural and sectoral change.

This working paper illustrates the potential and applications of EPMs, using the Philippines Employment Projection Model (PEPM) as an example. Section 1 describes the PEPM, and provides an analysis of the model's baseline results (mid-term employment projections), including with respect to employment targeting and the MDGs, and the sectoral structure of the economy. Section 2 discusses policy development and applications of EPMs, focusing on fiscal policy as well as the important issue of skills mismatch. Section 3 concludes with a discussion of further work and areas for development.

1. The Philippines Employment Projections Model (PEPM)

1.1. Background of the work

The ILO Employment Trends team has worked in collaboration with Inforum[4] (University of Maryland) to develop EPMs for a number of developing countries. EPMs vary in complexity and sophistication, depending on data availability and quality, as well as on resources involved in developing them. Models developed thus far for Ukraine,[5] Viet Nam,[6] Mongolia[7] and the Philippines can be considered as basic-to-intermediate models (having some elements associated with each of the two levels of sophistication).[8] Of these four countries however, the Philippines has the most extensive data and therefore a slightly more sophisticated model.

The development of the Philippines Employment Projections Model was commissioned by the ILO Country Office for the Philippines in September 2010. The model was developed in Stata software, using the ILO Trends – Inforum methodology (El Achkar, 2012). The initial version of the model was presented during a 7-day workshop held in Manila in November 2010, which aimed to introduce participants to EPMs and improve their capacity to use these analytical tools for more informed employment policymaking. Initial results were used as inputs for preparing the Philippines Development Plan (PDP) 2011-2016.[9] The model was subsequently updated and expanded in July 2011, and presented in August 2011 during a second 5-day workshop in Manila, which included an appreciation seminar for social partners, with tripartite representation.[10]

The most recent version of the PEPM, which is presented in this paper, has been updated in May 2012. In addition, this version was validated (in Stata) by Inforum (Meade, 2012), and results of this validation have been incorporated. The models developed by Inforum use a software framework called G7, which is the statistical estimation and time series program developed and distributed by Inforum. Building on G7, Interdyme is the framework for building employment projection models. In comparison with Stata, the G7/Interdyme modeling framework has several advantages and disadvantages. G7 is a flexible, interactive, easy to use free software program that provides powerful capabilities for the manipulation and viewing of scalar, vector and matrix variables in a time-series. However, the concepts of model building in G7/Interdyme are difficult, and Stata is more

[4] Inforum, or Interindustry Forecasting at the University of Maryland, has been developing employment projection models for over 20 years. The Inforum group has a network of partners in different countries that use a common methodology and software. For more information, see http://www.inforum.umd.edu.

[5] See Meade (2008).

[6] See Meade (2010) and Viet Nam Ministry of Labour, Invalids and Social Affairs (2011).

[7] See El Achkar Hilal (2011).

[8] Data requirements for three levels of sophistication of employment projection models (basic, intermediate and advanced) are explained in Werling and Meade (2010).

[9] The PDP 2011-2016 is available at: http://www.neda.gov.ph/PDP/2011-2016/default.asp.

[10] Workshop participants included officials from the Department of Labour and Employment (DOLE) – specifically the Institute for Labour Studies (ILS) and the Bureau for Labour and Employment Statistics (BLES) within DOLE – the National Statistics Office (NSO), the National Economic Development Authority (NEDA), the National Statistical Coordination Bureau (NSCB) and the Department of Trade and Investment (DTI).

familiar to many economic and labour market analysts. Although Stata was primarily designed as statistical software, the features are sufficiently flexible to enable the creation of datasets that can implement vectors or matrices of data over time.

1.2. Brief description of the model

One of the advantages of the EPMs framework is that it brings together economic and labour market variables, enabling users to analyse relationships between the two sets of variables.[11] Specifically, economic variables in the PEPM include National Accounts data: Input-Output (IO) table for 2000, elements of the 2006 IO table, Gross Domestic Product (GDP) and its components in current and constant units for 1998-2010, and real and nominal GDP by sector data, also for 1998-2010. The relationships contained in a country's IO Table are at the core of these models. Therefore, the models explicitly account for inter-industry linkages as well as the different industries' contributions to country's GDP through both the expenditure and income approaches.

Labour market variables include employment by sector and by occupation, the labour force, the working-age population, labour force participation rate, unemployment rate and other indicators. The PEPM includes annual labour market indicators and figures, compiled from quarterly Labour Force Survey (LFS) micro-datasets for 2001-2010,[12] as well as merged Family Income and Expenditure Survey (FIES) – LFS micro-datasets for the years 2000, 2003, 2006 and 2009. Compiling figures from the micro-datasets ensures the consistency of the definitions and measurements used, and therefore data comparability across time. In addition, labour force, working-age population and labour force participation data from the ILO's Economically Active Population Estimates and Projections (EAPEP) database (1980-2020, see ILO, 2011a) are used for exogenous assumptions on labour force growth over the forecast period.

Most of the data listed above were available from the National Statistics Office (NSO), the National Economic Development Authority (NEDA), and the National Statistical Coordination Bureau (NSCB), either on the departments' and agencies' websites, or upon request. Additional data on remittances were obtained from the Philippines Central Bank,[13] and government finances data were obtained from the World Bank's World Development Indicators (WDI) database. GDP expenditure components and deflators forecast (2011-2020) data were obtained from the Economist Intelligence Unit (EIU), and real and nominal GDP estimates and forecasts (1985-2015) used mainly for comparison purposes and as a basis for some of the exogenous assumptions, were obtained from the International Monetary Fund (IMF).

Before the model can be run, input data are adjusted to ensure consistency and comparability across data sources and years, and also to fill-in missing observations. In particular, data are adjusted to obtain a consistent national accounts framework over time (for all years over the historical period). This involves:

- Aggregating industry data such that data from all sources refer to the same 25 industries, based on the Philippines Standard Industrial Classification System (PSIC) 1-digit

[11] For more information on the theoretical framework and foundations of the models, please refer to Almon (2012), 'The Craft of Economic Modeling', available at: http://inforumweb.umd.edu/papers/publishedwork/books/craft1.pdf.

[12] Note that annual data for 2002 from the LFS refers to the average of the first three quarters of the year only.

[13] Bangko Sentral Ng Pilipinas: http://www.bsp.gov.ph/

level.[14] The 25 industries include 7 manufacturing sectors which allow for a detailed analysis of the effects of industrial policies.

- Adjusting GDP expenditure components data to national account totals for all years.
- Ensuring that real variables refer to the same base year, in this case 2000.
- Interpolating data to fill-in missing observations in time series.
- Updating the IO table consistently with the industry and national account totals, using the RAS procedure.[15]

1.2.1. Model mechanics

In the PEPM, some variables are endogenously determined, while others are assumed to grow based on an exogenous forecast. Assumptions regarding the exogenous growth of variables can be modified to produce alternative scenarios. Annex 1 contains a list of data sources, endogenous and exogenous variables.

The PEPM is specified as a series of loops within which a number of equations are run, and variables are simultaneously determined. Specifically, the major (largest) loop is the annual loop, which runs once for each year of the forecast (2011-2020). Within the annual loop is the GDP loop, which runs several times until the forecast year's GDP and its components converge (their value no longer changes from one iteration to another). Within the GDP loop, there is the output loop, which also runs several times until gross output for all industries converges for the year of the forecast. Within the output loop, an iterative process called Seidel takes place, which solves the input-output identity and simultaneously determines gross output and imports by industry. Productivity ratios are then used to obtain employment by industry, and industry-occupation matrices are used to obtain employment by occupation. The model has also been extended to provide information on the quality of employment, specifically, by projecting vulnerable employment and working poverty by industry.

At the beginning of each annual loop, final demand components (private and government consumption, gross capital formation, and exports) are obtained in real terms, at the industry and aggregate levels. Depending on the models, some expenditure components of GDP at the aggregate level are determined exogenously,[16] while others are endogenous, simultaneously determined with GDP. In the current version of the PEPM, three expenditure components are endogenously determined (simultaneously with GDP): Private consumption, through a consumption equation; government consumption, through a

[14] Information on the 2009 PSIC is available at http://www.nscb.gov.ph/csd/psic1.asp. The industry groups used in the PEPM correspond to the 1-digit PSIC classification, with the exception of the manufacturing sector, which is further disaggregated.

[15] The RAS procedure is a widely used method which was first mentioned by Leontief in the 1941 edition of *The Structure of the American Economy*, but the idea seemed to pass unnoticed until Stone's description of the method in *A Computable Model of Economic Growth* (Chapman and Hall, London, 1962). The method requires an IO table (estimated from full data) for a past year, and row and column sums for the current year IO table. The procedure, also referred to as '*Bi-proportional adjustment*' consists in finding a set of multipliers (R) to adjust the rows of the existing matrix (A), and a set of multipliers (S) to adjust the columns, so that the cells in the adjusted matrix sum to required row and column totals in the current year.

[16] Assumptions on the growth of the exogenous GDP components at the aggregate level are based on the Economist Intelligence Unit (EIU) forecast, and adjusted for consistency with the International Monetary Fund (IMF) forecast.

government spending equation;[17] and imports, aggregated from industry imports determined through the Seidel process.[18] Note that gross capital formation, which was endogenous in previous versions of the PEPM is now exogenously determined.[19] This change was made mainly because of the somewhat strange historical relationship between investment and growth in the Philippines.[20] Furthermore, making investment exogenous limits the number of GDP components determined endogenously in the PEPM to three, thus making the model's GDP forecast more consistent with that of the Economist Intelligence Unit.

After the private consumption and government spending equations are run, each of the final demands are determined at the industry level through regressions that use a combination of variables among the macro-level variables determined in the previous steps and industry output.[21] The idea behind using the macro-level variables in the corresponding industry-level regressions is to link the growth of the industry level variables with the growth of the variable at the aggregate level. This is consistent with the data adjustment procedure used to extrapolate the industry-level final demands over the historical period, using the growth of the corresponding aggregate level final demands (national account control totals).

Note that again, because of the model specification as a system of simultaneous equations, some of the dependent variables are determined jointly with some of the regressors, which has implications for the interpretation of regression results and coefficients. The industry level private consumption of households (fceh, with an 'R' and 'N' indicating real or nominal values, respectively), gross capital formation (gcf) and exports (ex) equations were specified as follows for most sectors:

$$var_t = \alpha + \beta_1 var_{t-1} + \beta_2 varR_t + \beta_3 varR_{t-1} + \varepsilon$$

where var = {fceh, gcf, ex}

In some cases, where the above regressions resulted in a poor fit, the equations were slightly modified. Specifically, for eight sectors,[22] the final private consumption equation was modified as follows:

[17] The consumption equation and government spending equation are discussed in El Achkar Hilal (2012).

[18] In the initial version of the PEPM, gross capital formation and imports were endogenously determined, while private consumption, government consumption and exports were projected based on exogenous assumptions. In the 2011 PEPM, household consumption was also made endogenous. In the most recent version of the PEPM, gross capital formation was made exogenous, and government consumption made endogenous instead.

[19] Specifically, in the 2011 PEPM, gross capital formation was determined through the investment equation, specified as follows: $gcfR_t = \alpha + \beta_1 gdpR_t + \beta_2\ gdpR_{t-1} + \beta_3\ gcfR_{t-1} + \varepsilon_t$

[20] See: "Rising Growth, Declining Investment: The Puzzle of the Philippines", A.M. Bocchi, *World Bank Policy Research Working Paper 4472*

[21] Note that in previous versions of the PEPM, the growth rate of industry level final demands was forecasted exogenously, based on historical trends and additional information (e.g. planned investment or government spending in certain sectors). The industry level final demands have therefore been 'endogenized' in the most recent version of the PEPM.

[22] The eight sectors are: Agriculture, Forestry and Fishing (1); Mining and Quarrying (2); Manufacturing of Non-metallic Mineral Products (6); Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles (13); Transportation and Storage (14); Accommodation and Food Service Activities (15); Administrative and Support Service Activities (20); and Education (22).

$$fceh_t = \alpha + \beta_1 fceh_{t-1} + \beta_2 fceh_{t-2} + \beta_3 fcehR_t + \beta_4 fcehR_{t-1} + \varepsilon$$

For two sectors,[23] the exports equation was modified as follows:

$$ex_t = \alpha + \beta_1 ex_{t-1} + \beta_2 (gross\ output)_{t-1} + \beta_3 exR_t + \beta_4 exR_{t-1} + \varepsilon$$

Final government consumption at the industry-level was also specified for the three industry sectors[24] for which it is relevant and set to zero for the other sectors, as per the Philippines' IO table. Therefore, for each of the public administration, education and health care sectors, government final consumption (fceg) was specified as:

$$fceg_t = \alpha + fceg_{t-1} + fcegR_t + fcegR_{t-1} + \varepsilon$$

The import share of domestic demand is also extrapolated over the forecast period for each sector, using a linear trend.

A smoothing technique is used to ensure that the final demands obtained through the industry-level regressions do not result in extreme values. Specifically, when the absolute value of the change in final demand for a sector exceeds 15 per cent, only half of this change is applied to the relevant variable. The industry-level final demands are then scaled to be consistent with the aggregate level final demands determined through the macro-level equations or exogenous assumptions.[25]

In addition to these equations, gross output by industry and industry imports are also determined within the GDP loop through a process called Seidel as mentioned above. Seidel is an iterative process (method of successive approximations) used to solve the input-output identity and translate the final demand components for each industry into gross output by industry.[26]

1.3. Baseline results & analysis: crisis, recovery and mid-term projections

This section provides an analysis of the results of the latest PEPM run, given the baseline assumptions of the model. The assumptions can be modified to allow for scenario modeling as explained further below.

The section starts with an analysis of the model's results at the macro (national) level, and then examines the Philippines' progress with respect to the MDG employment targets. It aims to demonstrate the wealth of information that is generated by employment projection models. This information includes industry-level developments of value added and employment, measures of employment quality (as captured by the MDG employment indicators), as well as occupational forecasts. This information can be used to inform

[23] The two sectors are: Manufacturing and Repair of Furniture, Recycling and Manufacturing NEC (9) and Construction (12).

[24] Specifically, the industry-level final demand equation was specified for: Public Administration and Defense, Compulsory Social Security (21); Education (22); Human Health and Social Work Activities (23).

[25] This is done with a technique called 'right direction scale' which is a method of proportionally scaling a vector while taking into account the sign of the vector elements (method used to ensure that scaling results are accurate in the presence of both positive and negative vector elements).

[26] A more extensive description of the model's specification and solution, including the Seidel process, can be found in El Achkar Hilal (2012).

policymakers on issues such as the identification of sub-sectors that are pivotal in the generation of decent work opportunities, and the future demand for education and skills.

The forecast period presented in this paper is between 2010 (last year for which most data are available) and 2016, chosen for consistency with the timeframe of the PDP 2011-2016. However, the model's projection period can be extended to 2020. When discussing the MDGs, however, the forecast period is limited to 2015, which is the target date for the achievement of the Goals.

1.3.1. The Philippines' economy and outlook

The Philippines economy grew at an average annual rate of 4.8 per cent between 2000 and 2010, despite a number of crises related to export shocks, food and fuel prices, politics and natural disasters (table 1). The recent global economic crisis, which started in developed economies in 2008 and spread to developing economies, resulted in slower economic growth (1.1 per cent) for the Philippines in 2009. A significant decline in demand from abroad affected export-oriented sectors, and the impact spread to other sectors through lower domestic demand. Although export sectors are concentrated in urban areas, rural areas were also affected through lower remittances, reverse labour migration, and a decline in prices of minerals and agricultural exports. Lower domestic demand also affected imports, which declined by 8.1 per cent in 2009.

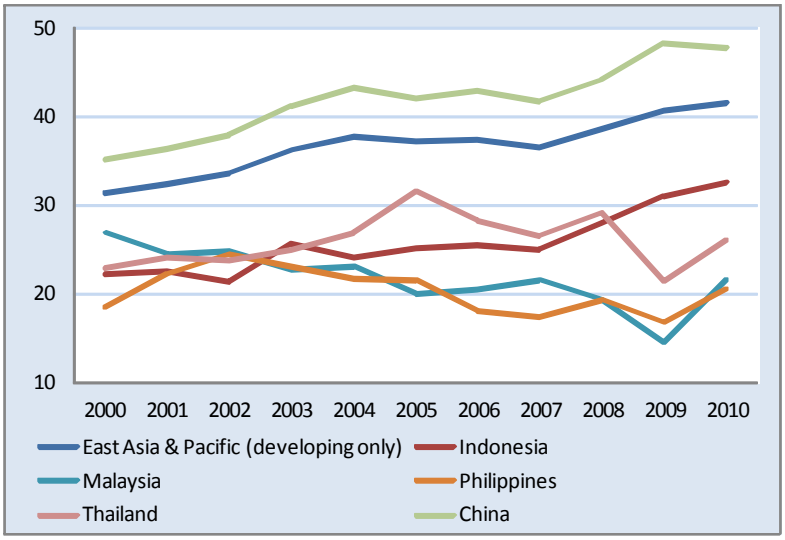
Table 1 Real GDP and its components

							Annual or average annual change (%)					
	Actual				*Projected*		*Actual*			*Projected*		
	2000	**2008**	**2009**	**2010**	**2013**	**2016**	**00-10**	**08-09**	**09-10**	**10-13**	**13-16**	**10-16**
Real GDP	3'581	5'237	5'297	5'702	6'452	7'734	4.8	1.1	7.6	4.2	6.2	5.2
Final consumption	2'994	4'225	4'366	4'516	5'064	5'817	4.2	3.3	3.4	3.9	4.7	4.3
Final consumption of Households	2'585	3'731	3'818	3'946	4'429	5'084	4.3	2.3	3.4	3.9	4.7	4.3
Final consumption of government	409	494	548	570	635	733	3.4	10.9	4.0	3.6	4.9	4.3
Gross capital formation	658	985	899	1'184	1'346	1'571	6.1	-8.7	31.6	4.4	5.3	4.8
Net exports	-71	27	32	2	43	346						
Exports	1'839	2'589	2'386	2'886	3'062	3'744	4.6	-7.8	21.0	2.0	6.9	4.4
Imports	1'911	2'561	2'354	2'884	3'020	3'399	4.2	-8.1	22.5	1.5	4.0	2.8

Source: NSCB and PEPM 2012

Gross capital formation also declined in 2009, due to lower Foreign Direct Investment (FDI) flows from crisis affected countries, and to higher levels of uncertainty and risk. Even prior to the crisis, however, the gross capital formation share in GDP had been relatively low in the Philippines, largely due to declining domestic investment which has been stagnant in real terms but decreasing as a share of GDP. Figure 1, which illustrates gross capital formation as a share of GDP for selected East Asian economies, shows that the Philippines' performance in this regard has fallen short of that of most of its neighbours.

Figure 1 Gross capital formation (% of GDP) - Selected economies in East Asia & the Pacific



Source: World Bank, World Development Indicators, 2012

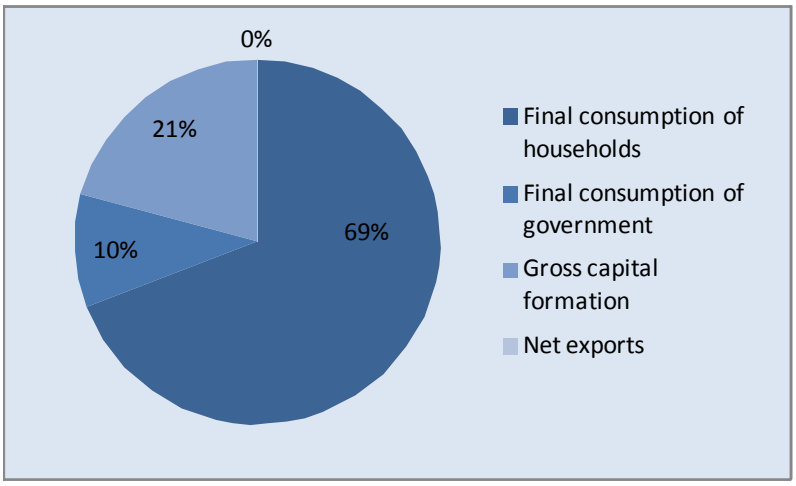
The low level of domestic investment in the Philippines, despite relatively high economic growth rates, has been the subject of much debate. Among the explanations provided are: inadequate infrastructure and transport and logistics network (ADB, 2007a); weak institutions, bureaucratic inefficiency and corruption (NEDA, 2011); fiscal constraints on government investment, which in turn deters private investment; low marginal return to capital for capital-intensive firms; rent-seeking activities of large corporate conglomerates controlled by politically influential local elites; and fast growth in low capital-intensive services sectors, such as the business process outsourcing (BPO) and information and communication technology (ICT) sectors, which do not require rapid investment growth to benefit from high profits (Bocchi, 2008).

The decreases in exports (-7.8 per cent) and in gross capital formation (-8.7 per cent) in 2009 were offset by a significant increase in government spending (10.9 per cent) and by sustained growth in private consumption expenditure (2.3 per cent) (table 1). The rise in government spending or the final consumption of government was due to a policy response, adopted by a number of governments around the world, of implementing stimulus packages and special measures to mitigate the crisis impact on workers and their families. Government expenditure had been on the rise even prior to the crisis, enabled by the reform of the value added tax system in 2005 (Aldaba and Hermoso, 2010).

Growth in private consumption expenditure or final expenditure of households was slower than the recent years' average, but remained positive nevertheless. It is likely that this increase was supported by the steady flow of remittances, which, contrary to expectations did not decline during the crisis (Aldaba and Hermoso, 2010).

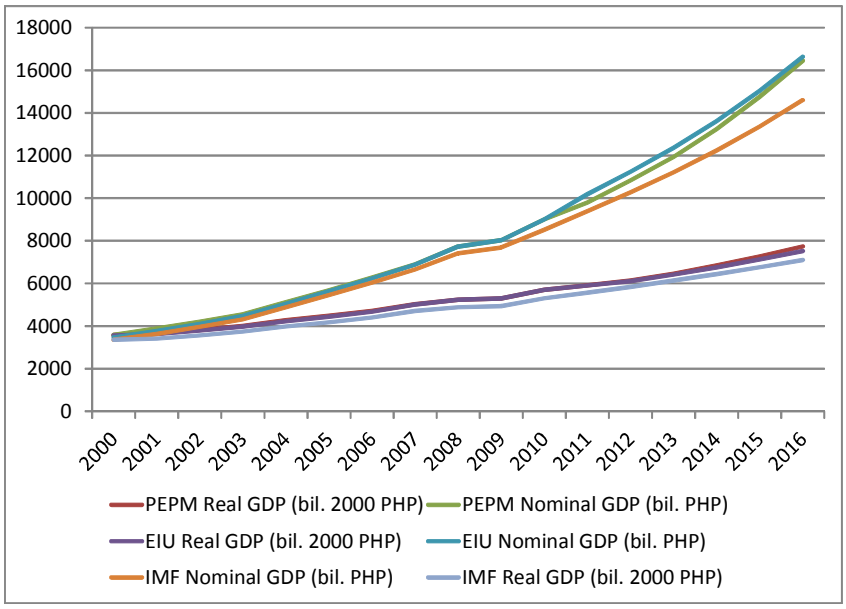
The Philippines economy is largely driven by private consumption expenditure, which remains the largest component of GDP (nearly 70 per cent of GDP in 2010, figure 2). Remittances play an important role in reducing the volatility of private consumption in the Philippines, a function often referred to as 'consumption smoothing', particularly in the informal sector of the economy (Bocchi, 2008).

Figure 2 GDP by expenditure category - 2010



Source: NSCB

Figure 3 Real and Nominal GDP - Forecasts comparison



Sources: IMF, WEO; EIU 2012; PEPM 2012

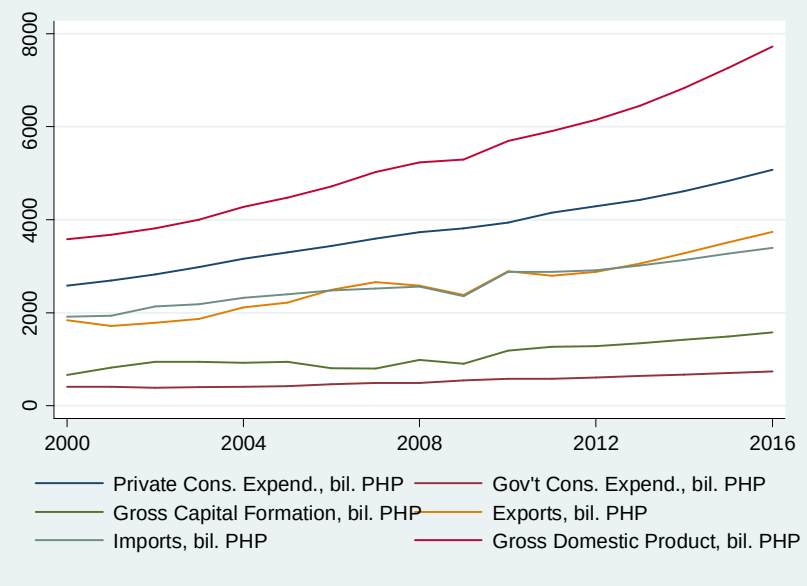
The economy recovered in 2010, with a growth rate of 7.6 per cent, driven by a 31.6 per cent rise in gross capital formation and a 21 per cent increase in exports (table 1). Imports rebounded as well, growing by 22.5 per cent. Private consumption growth was higher than in 2009, with 3.4 per cent. Government consumption growth was lower than in 2009, but remained relatively high at 4 per cent.

The Philippines' economy is forecasted to grow at an average annual rate of 4.2 per cent between 2010 and 2013, and of 6.2 per cent between 2013 and 2016, which results in an average annual rate of 5.2 per cent over the forecast period (2010-2016). The forecasted real GDP growth is slightly higher than the IMF and EIU forecasts (figure 3), but lower than the government target of 7-8 per cent under the PDP (NEDA, 2011, p.32).

Final household consumption and final government consumption are projected to grow at an average annual rate of 4.3 per cent over the forecast period. This growth rate is

equivalent to that of the historical period (2000-2010) for private consumption, but higher than that of the historical period for government consumption.[27] Gross capital formation is projected to grow at an average annual rate of 4.8 per cent over the forecast period; exports are expected to grow at an average annual rate of 4.4 per cent, while imports are only forecasted to grow at an average rate annual rate of 2.8 per cent.[28] Figure 4 illustrates the growth of GDP expenditure components over the historical and forecast periods.

Figure 4 Real GDP and its components



Source: PEPM 2012

1.3.2. Labour market situation and outlook

Limited productive employment opportunities in the formal sector in the Philippines have resulted in a large number of people seeking jobs abroad, and have discouraged others from participating in the labour market, as reflected in relatively low labour force participation rates compared to other Asian countries (King Desjardin, 2010). In 2010, the working-age population of the Philippines, which consists of the population aged 15 years and older, excluding overseas Filipino workers (OFWs) was just over 60 million people, nearly two-thirds of the total population. Out of these 60 million, only 39 million were in the labour force, including 36 million employed persons (table 2).

Between 2001 and 2010, the labour force and employment grew at the same average annual rate as the working-age population (2.4 per cent). As a result, the labour force

[27] The underlying baseline assumptions behind the forecasted growth of these two variables are a linear trend over the forecast period in the growth of tax revenues, government spending, official development assistance (ODA), and slowly decreasing remittances growth (growth rate forecasted by the Central Bank for 2011, decreasing slowly to the historical average by 2020). The assumptions behind the growth of government consumption will be revised to simulate a lower government spending/austerity scenario and analysed in Section 2.2. The assumptions on the growth of remittances have also been revised and analysed to produce alternate scenarios, but these are not discussed in this paper, which presents a selected number of applications of the PEPM.

[28] The growth rates of gross capital formation and of exports are exogenously determined in the model; they are based on the EIU forecast. The growth rate of imports is endogenously determined (please refer to El Achkar Hilal, 2012, for more information regarding the model's assumptions and specification).

participation rate (LFPR) and employment-to-population ratio (EPR) did not increase during this period. Indeed, both the LFPR and the EPR decreased between 2001 and 2008. In 2009, the LFPR increased by 0.4 percentage points, partly due to the 'added-worker effect' – an increase in labour force participation as household members join the workforce to compensate for the decline in household income. This effect is also likely to have driven the 2.9 per cent net employment growth and the rise in EPR in 2009. In 2010, both the LFPR and EPR increased slightly, by 0.1 percentage point.

The unemployment rate in the Philippines increased from 7.0 per cent in 2001 to 7.4 per cent in 2008. In 2009, it increased slightly to 7.5 per cent before decreasing to 7.3 per cent in 2010. In a developing country like the Philippines, the unemployment rate alone does not adequately reflect the extent of labour underutilization. This is because a large share of workers is involved in low-productivity work, or vulnerable employment, often in the informal sector, or is underemployed. Nevertheless, the unemployment rate of the Philippines is high relative to other developing countries. A number of explanations for this relatively high unemployment rate have been suggested, including limited employment opportunities and an inefficiently protected formal labour market where regulation is driven by political rather than economic imperatives (Bocchi, 2008).

Table 2 Labour market aggregates

							Annual or average annual change (%)					
	Actual				*Projected*		*Actual*			*Projected*		
	2001	**2008**	**2009**	**2010**	**2013**	**2016**	**01-10**	**08-09**	**09-10**	**10-13**	**13-16**	**10-16**
Total population (mil.)	77.7	90.2	92.0	93.8	99.1	104.4	2.1	2.0	1.9	1.9	1.8	1.8
Working age population (15+, mil.)*	48.9	57.8	59.2	60.7	65.2	69.6	2.4	2.4	2.5	2.4	2.2	2.3
Labor Force (mil.)	31.4	36.8	37.9	38.9	41.6	44.5	2.4	3.0	2.6	2.3	2.2	2.3
Employment (mil.)	29.2	34.1	35.1	36.0	38.4	41.4	2.4	2.9	2.8	2.2	2.5	2.3
Unemployment (mil.)	2.2	2.7	2.8	2.9	3.2	3.1	3.0	4.2	1.0	3.9	-0.9	1.5
Labour Productivity (thous. PHP per worker)	126.4	153.6	151.1	158.2	167.9	186.9	2.5	-1.7	4.7	2.0	3.6	2.8
Labor Force Participation Rate (%)	64.1	63.6	64.0	64.1	63.9	63.9						
Employment-to-population Rate (%)	59.6	58.9	59.2	59.3	59.0	59.4						
Unemployment Rate (%)	7.0	7.4	7.5	7.3	7.7	7.0						

Source: PEPM 2012

The slowdown in economic activity caused labour productivity to drop by 1.7 per cent in 2009. This was followed by high productivity growth (4.7 per cent) as the economy recovered in 2010. Labour productivity is projected to grow at an annual average rate of 2.0 per cent between 2010 and 2013, and of 3.6 per cent between 2013 and 2016. The projected average annual growth rate of labour productivity over the forecast period (2.8 per cent) surpasses that of the 2001-2010 period (2.5 per cent).

Labour force growth is projected to be slightly slower than that of the working-age-population between 2010 and 2013, resulting in a decrease in the labour force participation rate to 63.9 per cent.[29] The labour force participation rate is then projected to remain relatively constant over the rest of the forecast period.

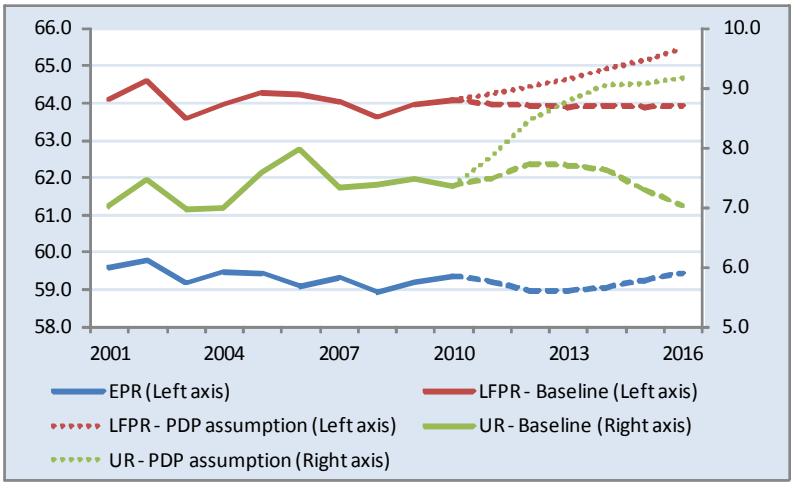
[29] Labour force and working-age population growth projections are taken from the EAPEP database (ILO, 2011a), as exogenous assumptions in the PEPM 2012.

Employment growth is projected to be slower than working-age population growth between 2010 and 2013, but faster than working-age population growth for the rest of forecast period. As a result the EPR is projected to decline to 59.0 per cent by 2013, but increase back to 59.4 per cent by 2016.

The net employment growth projection of 5.4 million workers between 2010 and 2016 is slightly below the PDP 2011-2016 target of 6 million.[30]

The unemployment rate is projected to increase to 7.7 per cent in 2012, and decline thereafter to 7.0 per cent by 2016. In the first half of the projection period, the unemployment rate would be higher than the rates expected in the PDP (6.8 – 7.0 per cent) but would converge towards these rates in the second half of the projection period. Note that the PEPM GDP growth forecast is also lower than the PDP target. If higher growth rates were realised, the unemployment rate forecast would be revised downwards (provided labour force participation does not change).

Figure 5 EPR, LFPR and UR (2001-2016)



Sources: LFS (2001-2010), ILO (2011a), and PEPM 2012

The PEPM unemployment rate projection is also based on the above-mentioned labour force projections (from EAPEP). The labour force growth projection in the PDP 2011-2016 is higher, however (2.75 per cent annual growth instead of 2.3 per cent over the forecast period). If the PDP labour force participation rate projections were realised, the LFPR would increase steadily over the forecast period to 65.4 per cent in 2016 (figure 5). The unemployment rate (UR) would also continue to increase over the forecast period, however, to 9.2 per cent in 2016. Thus, because the PEPM's main output is the employment forecast, and unemployment is obtained as a residual from the exogenously determined labour force, an increase in the labour force due to a change in the model's assumptions is absorbed entirely into unemployment. In order for some of the additional labour market participants to be absorbed into employment, additional assumptions such as those underlying the economy's growth forecast would have to change as well. In other words, unless we also assume that economic growth will be faster than the baseline scenario, leading to higher employment growth, the additional labour force growth will result in higher unemployment levels and rate.

[30] NEDA (2011), Chapter 3, p.84. Note that the PDP projection is based on results of a previous run (and previous version) of the PEPM.

Because a large number of workers in developing economies are engaged in low productivity, vulnerable employment, often in the informal sector, employment and unemployment rates and trends alone are not sufficient to adequately depict the labour market situation in these economies. Additional indicators that reflect the quality of employment and the living standards of workers are also needed for a more complete analysis. EPMs can be extended to allow projecting these additional indicators, some of which are presented in the next section.

1.3.3. Quality of employment

In this paper, the employment indicators used to measure progress on achieving MDG target 1B are used to assess the quality of employment (see box 1). Out of the 36 million workers in the Philippines in 2010, 15 million or 41.7 per cent were either own-account workers or contributing family workers – the two employment status categories that constitute vulnerable employment (table 3). Vulnerable workers usually suffer from inadequate working conditions, have low productivity and income, and lack social security protection, as these workers are often employed in the informal sector. They and their families are therefore often at risk of living in poverty. In 2010, 6 million workers or 16.6 per cent of the employed in the Philippines were living with their families in extreme poverty, or below the international poverty line of 1.25 $/day, adjusted for purchasing power parity (PPP), and another 8 million people were living under the 2.00 $/ day poverty line.

Table 3 Quality of employment

							Annual or average annual change (%)					
	Actual				Projected		Actual			*Projected*		
	2003	2006	2009	2010	2013	2016	03-06	06-09	09-10	10-13	13-16	10-16
Employment (mil.)	30.6	32.6	35.1	36.0	38.4	41.4	2.1	2.4	2.8	2.2	2.5	2.3
Vulnerable employment (mil.)	13.7	14.5	14.9	15.0	15.9	16.7	2.1	0.9	0.5	1.9	1.7	1.8
VER (%)	44.6	44.5	42.6	41.7	41.4	40.4						
Working poverty (1.25$/day, mil.)	5.7	6.5	5.7	6.0	6.1	6.2	4.1	-4.2	5.8	0.7	0.3	0.5
WPR (1.25$/day, %)	18.7	19.8	16.2	16.6	15.9	14.9						
Working poverty (2.00$/day, mil.)	12.3	13.7	13.6	14.0	14.8	15.4	3.8	-0.2	2.9	1.7	1.4	1.6
WPR (2.00$/day, %)	40.1	42.1	38.9	39.0	38.4	37.2						

Sources: Sources: LFS and LFS-FIES (2003, 2006, 2009), PEPM 2012

Despite a decline of the vulnerable employment and working poverty rates over the historical period, the absolute number of vulnerable workers and working poor has increased over time (figure 6). This implies that employment growth has been largely driven by the growth in working-age population and to a lesser extent by the increased availability of decent work opportunities. This raises an important issue with respect to the quality of the employment that will be generated over the medium term. Indeed, PEPM baseline projection results suggest a continuation of historical trends over the forecast period.

Box 1. MDGs and employment targeting

Recent years have seen a growing interest in employment targeting (setting realistic employment targets as policy objectives) and using quantitative targets and indicators to measure progress on developmental objectives. In this context, EPMs are important tools for policy development and analysis. The attainment of employment and labour market objectives are increasingly considered as fundamental in and of themselves, and for the achievement of other developmental outcomes. The most widely referenced set of development targets are linked to the Millennium Development Goals (MDGs). The current framework of goals, targets and indicators ends in 2015, but discussions have already started on the post-2015 framework.

Four employment indicators are used to monitor progress on achieving target 1B (full and productive employment and decent work for all, including women and young people) under MDG Goal 1 (eradicate extreme poverty and hunger), and one employment indicator to measure progress on target 3A (eliminate gender disparity in primary and secondary education) under MDG Goal 3 (promote gender equality and empower women). Specifically, the MDG employment indicators are the following (ILO, 2012):

1.4 Growth rate of GDP per person employed (or growth rate of labour productivity - LP)
1.5 Employment-to-population ratio (EPR)
1.6 Proportion of employed people living below 1$ (PPP) per day (or working poverty rate - WPR)
1.7 Proportion of own-account and contributing family workers in total employment
(or vulnerable employment rate - VER)
3.2 Share of women in wage employment in the non-agricultural sector

Table 4 presents PEPM projections for the first four indicators. The fifth indicator requires disaggregating PEPM results by gender, which is an important and worthwhile extension to be undertaken in the future.

Table 4 MDG employment indicators

MDG Indicator:	1.4 LP growth rate	1.5 EPR	1.6 WPR1	1.7 VER
2003	2.8	59.1	18.7	44.6
2004	3.4	59.5	19.0	42.8
2005	2.5	59.4	19.4	44.8
2006	4.2	59.1	19.8	44.5
2007	3.7	59.3	18.5	43.6
2008	2.5	58.9	17.4	43.5
2009	-1.7	59.2	16.2	42.6
2010	4.7	59.3	16.6	41.7
2011	1.5	59.2	16.4	41.8
2012	1.9	59.0	16.2	41.6
2013	2.6	59.0	15.9	41.4
2014	3.5	59.0	15.6	41.1
2015	3.6	59.2	15.2	40.7
Total change (2005-2010, % point)	2.2	-0.1	-2.7	-3.1
Forecasted Change (2010-2015, % point)	-1.1	-0.1	-1.4	-0.9

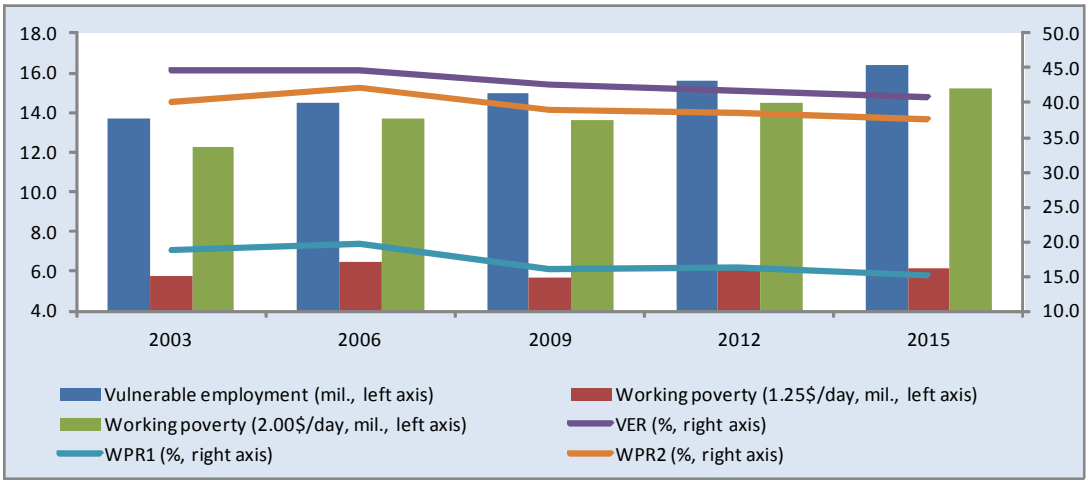
Sources: LFS-FIES (2003, 2006, 2009) and PEPM 2012

Between 2005 and 2010, some progress had been realised in terms of three out of the four indicators: labour productivity, measured as GDP per person employed, grew 2.2 percentage points faster in 2010 than in 2005, reflecting the rebound following the slowdown in economic growth in 2009; the working poverty rate was 2.7 percentage points lower; and the vulnerable employment rate was 2.1 percentage points lower. The employment-to-population ratio however was 0.1 percentage point lower in 2010 than it had been in 2005, indicating that employment growth had fallen short of the working-age population growth during this period.

Between 2010 and 2015, the target date for the achievement of the MDGs, more progress is expected in terms of further declines in the working poverty and vulnerable employment rates, but this progress is likely to be slower than that of the previous period. The employment-to-population ratio is forecasted to decrease by another 0.1 percentage point between 2010 and 2015, while labour productivity is forecasted to be 1.1 percentage points lower in 2015 than in 2010.

Therefore, results of the baseline forecasts, built on the assumption of recent historical trends continuing into the future, suggest that concerted policy action is needed to ensure that the country is on track for achieving the MDG employment targets by 2015. Such policy measures may include for instance, increasing investment in high productivity sectors (through direct government investment and/or incentives for private investment) to improve LP and increase decent work opportunities; support for SMEs; and subsidies and transfers targeting lower income households.

Figure 6 Vulnerable employment and working poverty (2003-2015)



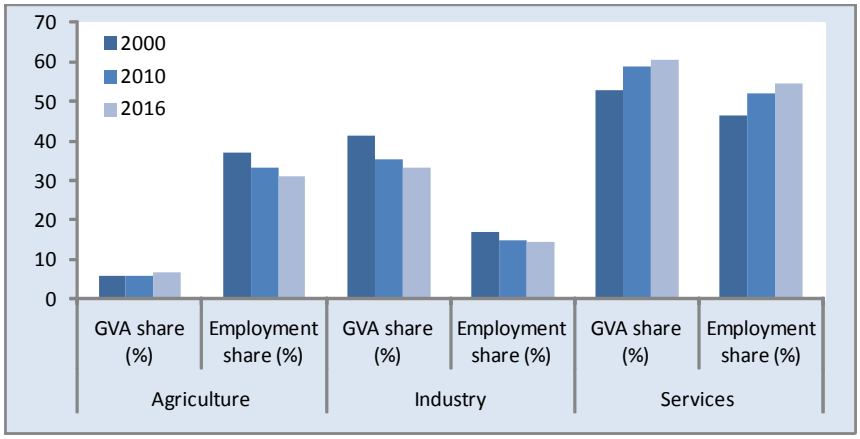
Sources: LFS and LFS-FIES (2003, 2006, 2009), PEPM 2012

Vulnerable employment is projected to grow at an average annual rate of 1.8 per cent during the forecast period, a rate that is slower than the employment growth rate (table 3). Therefore, the vulnerable employment rate is projected to continue declining to 40.4 per cent by 2016, despite an increase in the number of vulnerable workers. Similarly, working poverty rates are projected to continue declining, despite an increase in the number of working poor.

1.3.4 Industry level results

One of the strengths of EPMs is the ability to generate projections at the level of detailed industries. This section illustrates the use of EPMs for the identification of sectors or subsectors that could be pivotal in the generation of decent work opportunities. The PEPM 2012 covers 1-digit PSIC sectors, with further disaggregation for the manufacturing sector.

Figure 7 Employment and value added share by sector (2000, 2010, 2016)



Source: PEPM 2012

Agriculture

Between 2000 and 2010, the agriculture sector's value added share in the Philippines' economy remained nearly constant at approximately 6 per cent (figure 7). The sector's share in employment decreased from approximately 37 per cent in 2000 to 33 per cent in 2010. Nevertheless, in 2010, agriculture remained a major sector in terms of employment, with nearly twelve million workers (table 6).

Table 5 Agriculture final demands and gross value added

							Annual or average annual change (%)					
	Actual				Projected		Actual			Projected		
	2000	2008	2009	2010	2013	2016	00-10	08-09	09-10	10-13	13-16	10-16
Private consumption (bil. 2000 PHP)	173	172	189	143	207	170	-1.9	9.9	-24.7	13.2	-6.3	3.0
% of economy (all sectors) total	6.7	4.6	5.0	3.6	4.7	3.3						
Gross capital formation (bil. 2000 PHP)	45	142	125	172	219	280	14.5	-12.3	38.3	8.3	8.5	8.4
% of economy (all sectors) total	6.8	14.4	13.9	14.6	16.3	17.8						
Exports (bil. 2000 PHP)	30	75	68	76	96	132	9.8	-9.8	11.7	8.2	11.1	9.6
% of economy (all sectors) total	1.6	2.9	2.8	2.6	3.1	3.5						
Imports (bil. 2000 PHP)	37	49	44	54	66	79	4.0	-8.5	22.5	6.6	6.2	6.4
% of economy (all sectors) total	1.9	1.9	1.9	1.9	2.2	2.3						
Gross Value Added (bil. 2000 PHP)	211	341	338	337	456	503	4.8	-1.1	-0.3	10.7	3.3	6.9
% of economy (all sectors) total	5.9	6.5	6.4	5.9	7.1	6.5						

Source: PEPM 2012

In the PDP 2011-2016, agribusiness, forest-based and livestock industries have been identified as priority areas. The government has committed itself to solve pending property rights issues, improve infrastructure in rural areas, and expand and diversify export markets for agro-based products namely through newly signed Free Trade Agreements (FTAs), thus setting the stage for faster agriculture growth and investment. Over the forecast period, agriculture value added is forecast to grow at an average annual rate of 6.9 per cent, which is higher than the historical period's average of 4.8 per cent (table 5). The sector's share in value added is projected to increase to 6.5 per cent by 2016.

Table 6 Agriculture output, productivity and employment

							Annual or average annual change (%)					
	Actual				Projected		Actual			Projected		
	2000	2008	2009	2010	2013	2016	00-10	08-09	09-10	10-13	13-16	10-16
Output (bil. 2000 PHP)	662	969	961	959	1'160	1'389	3.8	-0.9	-0.2	6.6	6.2	6.4
Labour Productivity (thous. 2000 PHP per worker)	64	81	80	80	92	108	2.3	-1.0	0.5	4.8	5.5	5.1
Employment (thous.)	10'357	12'030	12'043	11'957	12'578	12'836	1.4	0.1	-0.7	1.7	0.7	1.2
Employment (share, %)	36.9	35.3	34.3	33.2	32.7	31.0						

Source: PEPM 2012

Similarly, agriculture output growth (6.4 per cent) is projected to be faster than the 2000-2010 average (3.8 per cent) (table 6). The sector's employment growth however is projected to be slower (1.2 per cent) than the historical average (1.4 per cent), and its share in employment is projected to continue declining – although at a slower pace than over the

historical period – to 31 per cent by 2016. Labour productivity growth in agriculture is therefore forecasted to increase at a higher average annual rate (5.1 per cent) over the forecast period than over the historical period (2.3 per cent).

Industry

Industry's share in value added in the Philippines declined from 41.2 per cent in 2000 to 35.3 per cent in 2010. Deindustrialization is forecast to continue with a decrease of industry's share in value added to 33 per cent by 2016 (table 7). This decline is partly attributable to the manufacturing sub-sector, which has seen its share in the country's GDP decrease in past years. Industrial output is projected to grow at an average annual rate of 3.9 per cent over the forecast period, which is slower than its growth rate of 6 per cent over the historical period (table 8). This is partly attributable to the slow projected growth of gross capital formation of only 1 per cent, compared to 3.4 per cent over the historical period.

Table 7 Industry final demands and gross value added

							Annual or average annual change (%)					
	Actual				*Projected*		*Actual*			*Projected*		
	2000	**2008**	**2009**	**2010**	**2013**	**2016**	**00-10**	**08-09**	**09-10**	**10-13**	**13-16**	**10-16**
Private consumption (bil. 2000 PHP)	880	1'398	1'339	1'481	1'594	1'876	5.3	-4.2	10.6	2.5	5.6	4.0
% of economy (all sectors) total	34.0	37.5	35.1	37.5	36.0	36.9						
Gross capital formation (bil. 2000 PHP)	573	694	649	804	824	852	3.4	-6.4	23.8	0.8	1.1	1.0
% of economy (all sectors) total	87.2	70.4	72.2	67.9	61.2	54.2						
Exports (bil. 2000 PHP)	1'597	1'910	1'761	2'066	2'113	2'477	2.6	-7.8	17.3	0.7	5.4	3.1
% of economy (all sectors) total	86.8	73.8	73.8	71.6	69.0	66.2						
Imports (bil. 2000 PHP)	1'574	2'085	1'908	2'338	2'398	2'654	4.0	-8.5	22.5	0.9	3.4	2.1
% of economy (all sectors) total	82.4	81.4	81.0	81.0	79.4	78.1						
Gross Value Added (bil. 2000 PHP)	1'476	1'917	1'841	2'013	2'133	2'551	3.2	-4.0	9.3	1.9	6.1	4.0
% of economy (all sectors) total	41.2	36.6	34.8	35.3	33.1	33.0						

Source: PEPM 2012

In 2010, some 5.4 million workers were employed in the industry sector, and this number is projected to increase to approximately 6 million by 2016 (table 8). Employment growth in industry is forecasted to be slightly higher (1.6 per cent compared to 1.4 per cent for the historical period). The sector's share in employment, which fell from 16.8 per cent in 2000 to 15 per cent in 2010, is projected to decline further to 14.4 per cent by 2016. This process of deindustrialisation is particularly alarming in the Philippines, because it is occurring at low level of industrial development (ADB, 2007b). The slow growth in industry employment may have significant implications, as the sector often comprises a higher share of decent work opportunities and higher productivity jobs. The industry sector's labour productivity was 15 times that of the agriculture sector, and 4 times that of the services sector in 2010. Labour productivity growth in the industry sector is forecasted to be slower (2.3 per cent) over the forecast period (table 8).

Industry employment is projected to be fastest (5.6 per cent annual growth over the forecast period) in mining and quarrying, a relatively small sector in terms of employment, with approximately 200 thousand workers in 2010. The mining industry in the Philippines was revitalised in 2004, and has been recognised for its growth potential (NEDA, 2011). The government wants to encourage investment in mining and mineral processing

industries and promote linkages between them and mineral-based manufacturing industries with the objective of doubling mining exports by 2016.[31]

Table 8 Industry output, productivity and employment

							Annual or average annual change (%)					
	Actual				Projected		Actual			Projected		
	2000	2008	2009	2010	2013	2016	00-10	08-09	09-10	10-13	13-16	10-16
Output (bil. 2000 PHP)	3'612	5'889	5'566	6'484	6'961	8'180	6.0	-5.5	16.5	2.4	5.5	3.9
Labour Productivity (thous. 2000 PHP per worker)	765	1'162	1'090	1'198	1'243	1'377	4.6	-6.2	9.9	1.2	3.5	2.3
Employment (thous.)	4'721	5'067	5'107	5'412	5'601	5'942	1.4	0.8	6.0	1.1	2.0	1.6
Employment (share, %)	16.8	14.9	14.6	15.0	14.6	14.4						

Source: PEPM 2012

Industry employment growth is projected to be slowest in manufacturing (only 0.5 per cent annual growth), which is the largest industry sub-sector in terms of employment, with over 3 million workers in 2010 (table 9). Employment growth in manufacturing is projected to be driven by growth in wood and paper products, printing and publishing, in food products, beverages, and tobacco products, in non-metallic mineral products and basic metal products.

Table 9 Employment by industry sub-sector

							Annual or average annual change (%)					
	Actual				Projected		Actual			Projected		
	2000	2008	2009	2010	2013	2016	00-10	08-09	09-10	10-13	13-16	10-16
Mining and Quarrying	103	158	166	199	225	276	7.5	5.0	19.8	4.2	7.1	5.6
Manufacturing	2'905	2'926	2'893	3'033	3'019	3'120	0.5	-1.1	4.8	-0.1	1.1	0.5
Food Products, Beverages, and Tobacco Products	682	711	750	791	851	923	1.6	5.5	5.5	2.5	2.7	2.6
Textiles, Wearing Apparel and Leather Products	768	658	619	629	541	489	-2.2	-5.9	1.6	-4.9	-3.3	-4.1
Wood and Paper Products, Printing and Publishing	361	425	452	480	542	627	3.2	6.3	6.2	4.2	4.9	4.5
Non-metallic Mineral Products	235	229	256	249	274	289	0.6	11.7	-2.6	3.2	1.8	2.5
Basic Metals and Metal Products	206	190	186	192	195	211	-0.8	-1.8	2.8	0.6	2.7	1.6
Machinery and Equipment	412	504	440	497	453	429	2.1	-12.7	12.9	-3.1	-1.8	-2.4
Manufacturing and Repair of Furniture, Recycling and Manufacturing NEC	240	209	190	195	163	152	-2.3	-9.1	2.7	-5.9	-2.2	-4.1
Electricity, Gas, Steam and Air-Conditioning Supply	84	82	88	85	86	92	0.0	7.2	-4.0	0.4	2.2	1.3
Water Supply, Sewerage, Waste Management and Remediation Activities	50	67	68	80	85	97	5.3	2.8	16.5	2.3	4.3	3.3
Construction	1'585	1'834	1'891	2'017	2'185	2'357	2.7	3.1	6.6	2.7	2.6	2.6
Industry	4'729	5'067	5'107	5'412	5'601	5'942	1.5	0.8	6.0	1.1	2.0	1.6

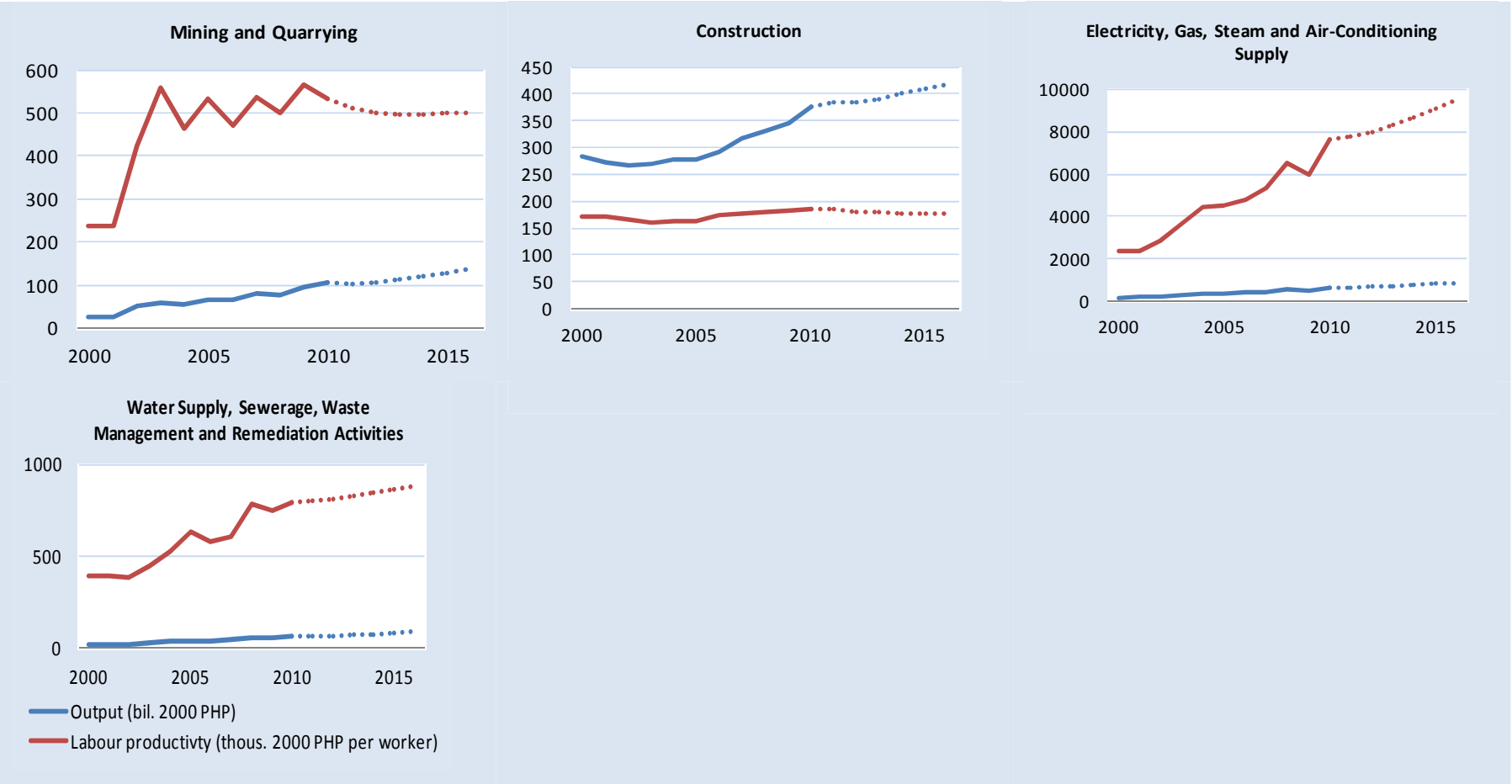
Source: PEPM 2012

[31] NEDA (2011), Chapter 3, p.90.

Figure 8 Output and labour productivity in manufacturing sub-sectors

Source: PEPM 2012

Figure 9 Output and labour productivity in other industry sub-sectors



Source: PEPM 2012

Other manufacturing sub-sectors are projected to have a decline in employment: textiles, wearing apparel and leather products; manufacturing and repair of furniture and other manufacturing not elsewhere classified; and machinery and equipment. In the two former subsectors, the declining trend in output and labour productivity over the past years should slow down or reverse (figure 8), but benefits in terms of employment growth are not expected in the medium term. In the latter subsector, output and productivity are projected to continue growing, but labour productivity growth is expected to surpass output growth, leading to a decline in employment. Note that the machinery and equipment subsector's labour productivity level is already considerably higher than the other manufacturing subsectors (figures 8 and 9). This subsector includes electronic products, the largest merchandise export of the Philippines, and accounted for some 55 per cent of manufacturing exports in 2010 (PEPM, 2012).

Employment in construction, the second largest industry sub-sector in terms of employment, is forecasted to continue growing at 2.6 per cent annually over the forecast period, which is nearly the same rate as the historical period. In the PDP 2011-2016, the government has stated its intention of using public private partnerships (PPPs) to implement significant infrastructure programs, which should raise the construction sector output and employment levels over the medium term. The government has also committed to increasing incentives for investment in mass and socialised housing and to increasing the target number of housing loans, in order to address a housing shortage. The Construction Industry Strategic Plan for the 21st Century or CI21 was also developed to provide a framework for faster growth of the construction industry (NEDA, 2011).

Employment in electricity, gas and steam and air-conditioning is projected to be modest (1.3 per cent) over the forecast period, while employment in water supply, sewerage, and waste management and remediation activities is projected to grow at 3.3 per cent (table 9).

Services

The services sector is the largest sector in the Philippines, both in terms of value added and employment (figure 7). In 2010, more than half of workers (51.2 per cent) were employed in services.

The sector's share in value added increased from 52.9 per cent in 2000 to 58.8 per cent in 2010, and is forecasted to increase further to 60.5 per cent by 2016 (table 10). The high growth in services value added is projected to be driven by sustained high growth of the sector's gross capital formation and exports.

The services sector's output is projected to grow at an average annual rate of 5.5 per cent over the forecast period, and its employment is projected to grow at an average annual rate of 3.2 per cent (table 11). As a result, the sector's share in employment is projected to continue growing, reaching 54.6 per cent of employment by 2016.

Table 10 Services final demands and gross value added

							Annual or average annual change (%)					
	Actual				Projected		Actual			Projected		
	2000	2008	2009	2010	2013	2016	00-10	08-09	09-10	10-13	13-16	10-16
Private consumption (bil. 2000 PHP)	1'533	2'161	2'290	2'322	2'628	3'038	4.2	6.0	1.4	4.2	5.0	4.6
% of economy (all sectors) total	59.3	57.9	60.0	58.9	59.3	59.8						
Government consumption (bil. 2000 PHP)	409	494	548	570	635	733	3.4	10.9	4.0	3.6	4.9	4.3
% of economy (all sectors) total	100.0	100.0	100.0	100.0	100.0	100.0						
Gross capital formation (bil. 2000 PHP)	40	149	125	207	303	440	18.0	-15.8	65.4	13.4	13.3	13.3
% of economy (all sectors) total	6.0	15.1	13.9	17.5	22.5	28.0						
Exports (bil. 2000 PHP)	213	603	557	744	854	1'136	13.3	-7.6	33.6	4.7	10.0	7.3
% of economy (all sectors) total	11.6	23.3	23.4	25.8	27.9	30.3						
Imports (bil. 2000 PHP)	300	428	402	492	555	666	5.1	-6.2	22.5	4.1	6.2	5.2
% of economy (all sectors) total	15.7	16.7	17.1	17.1	18.4	19.6						
Gross Value Added (bil. 2000 PHP)	1'894	2'979	3'119	3'352	3'863	4'681	5.9	4.7	7.5	4.8	6.6	5.7
% of economy (all sectors) total	52.9	56.9	58.9	58.8	59.9	60.5						

Source: PEPM 2012

Table 11 Services output, productivity and employment

							Annual or average annual change (%)					
	Actual				Projected		Actual			Projected		
	2000	2008	2009	2010	2013	2016	00-10	08-09	09-10	10-13	13-16	10-16
Output (bil. 2000 PHP)	2'766	4'560	4'818	5'232	5'971	7'205	6.6	5.7	8.6	4.5	6.5	5.5
Labour Productivity (thous. 2000 PHP per worker)	212	268	269	280	295	319	2.8	0.3	4.2	1.7	2.7	2.2
Employment (thous.)	13'028	16'992	17'911	18'666	20'255	22'595	3.7	5.4	4.2	2.8	3.7	3.2
Employment (share, %)	46.4	49.8	51.1	51.8	52.7	54.6						

Source: PEPM 2012

Labour productivity in the services sector is projected to grow at an average annual rate of 2.2 per cent over the forecast period (table 11). The service sector is far from homogenous, and its sub-sectors differ significantly in terms of labour productivity and working conditions (figure 10).

Within the overall services sector, employment growth rates are projected to be the highest in real estate activities (8.2 per cent annually over the forecast period), professional, scientific and technical services (6.3 per cent); and administrative and support service activities (6 per cent) (table 12). Note that for the first two sub-sectors, growth rates are from relatively low employment levels. The real estate activities industry is the services sub-sector with the highest labour productivity levels (figure 10). Note that the rapidly expanding call and contact centres, business processing outsourcing and other ICT-based services can be considered to fall under professional, scientific and technical services, administration and support services activities, and information and communication.[32] These

[32] These industries do not correspond directly to PSIC sectors, which complicates their classification. Under the 1994 PSIC, most BPO establishments were classified under (k) Real Estate, Renting and Business Activities, and others under (O) Other community, Social and Personal services activities. With

are the three subsectors that have had the highest employment growth over the historical period, and which are forecasted to continue to have high employment growth over the forecast period. The education sub-sector is also projected to have a high employment growth rate (average of 4.8 per cent and 4.2 per cent annually) over the forecast period.

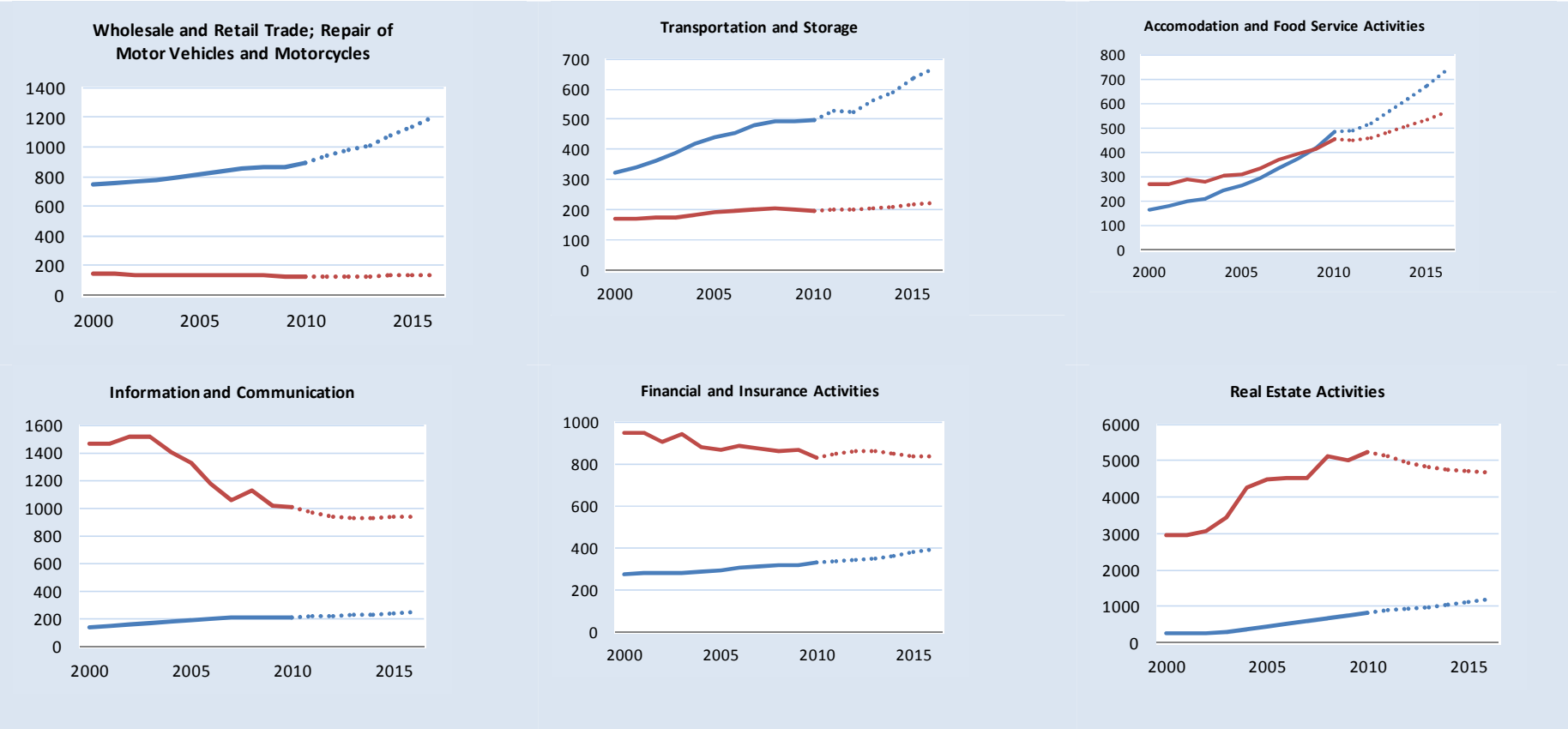
Table 12 Employment by services sub-sector

							Annual or average annual change (%)					
	Actual				*Projected*		*Actual*			*Projected*		
	2000	**2008**	**2009**	**2010**	**2013**	**2016**	**00-10**	**08-09**	**09-10**	**10-13**	**13-16**	**10-16**
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	5'255	6'446	6'735	7'034	7'714	8'709	3.3	4.5	4.4	3.1	4.1	3.6
Transportation and Storage	2'018	2'400	2'469	2'510	2'719	3'006	2.5	2.9	1.7	2.7	3.4	3.1
Accomodation and Food Service Activities	668	953	1'010	1'063	1'170	1'301	5.3	6.0	5.2	3.3	3.6	3.4
Information and Communication	100	190	210	213	244	272	8.7	10.8	1.3	4.7	3.7	4.2
Financial and Insurance Activities	292	368	369	400	407	471	3.6	0.4	8.3	0.6	5.0	2.8
Real Estate Activities	88	134	147	159	201	255	6.7	9.3	8.2	8.2	8.2	8.2
Professional, Scientific and Technical Services	61	122	137	152	180	220	10.8	12.4	10.8	5.7	7.0	6.3
Administrative and Support Service Activities	367	696	780	835	985	1'186	9.6	12.0	7.1	5.6	6.4	6.0
Public Administration and Defense; Compulsory Social Security	1'382	1'676	1'749	1'847	1'993	2'220	3.3	4.3	5.6	2.6	3.7	3.1
Education	920	1'071	1'138	1'176	1'297	1'554	2.8	6.2	3.4	3.3	6.2	4.8
Human Health and Social Work Activities	314	391	421	451	461	477	4.1	7.6	7.0	0.8	1.1	1.0
Arts, Entertainment and recreation	245	309	336	347	361	376	3.9	8.7	3.1	1.3	1.4	1.4
Other Service Activities	1'867	2'235	2'409	2'480	2'522	2'548	3.2	7.8	2.9	0.6	0.3	0.5
Services total	13'577	16'992	17'911	18'666	20'255	22'595	3.6	5.4	4.2	2.8	3.7	3.2

Source: PEPM 2012

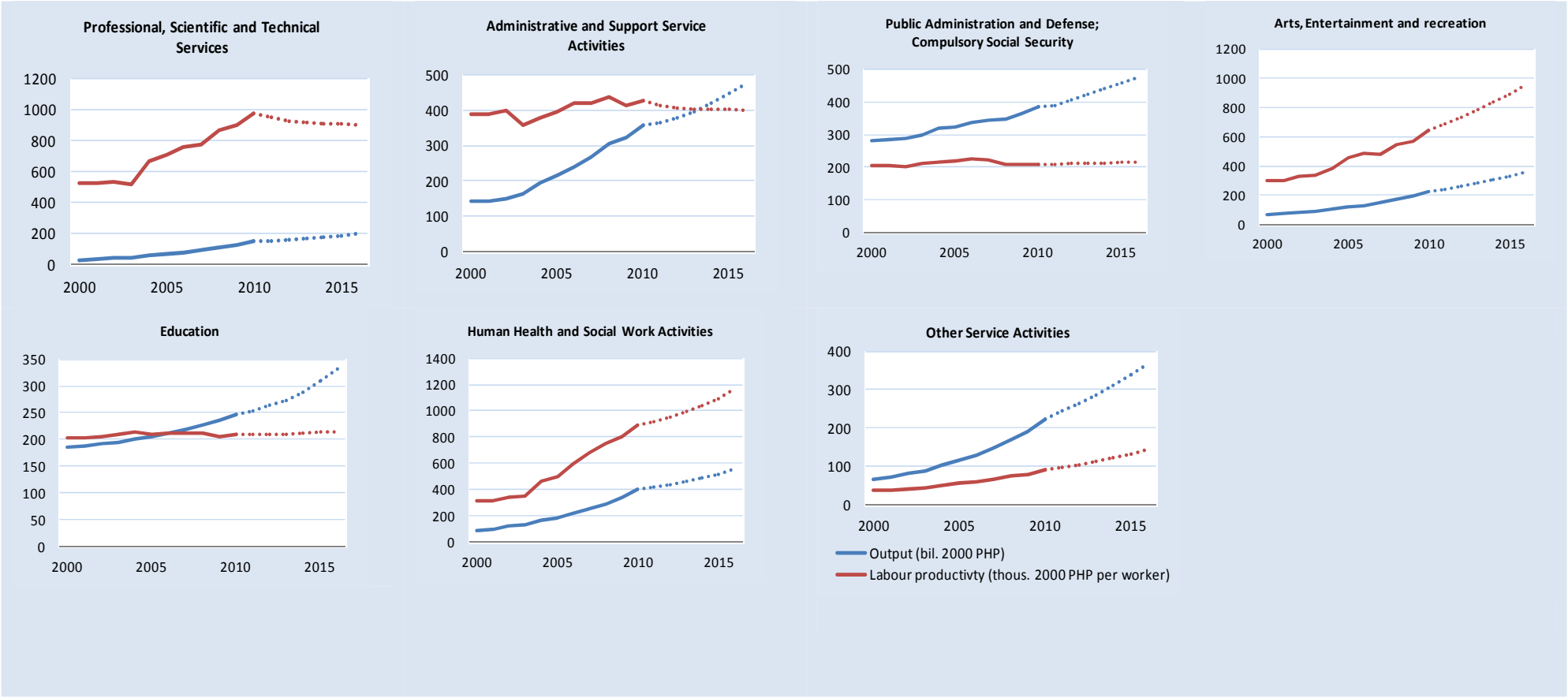
the 2009 PSIC, sector K was split with activities related to BPOs falling under either (M) Professional, scientific and technical services, or (N) Administration and support services activities subsectors, while other relevant activities (software publishing and IT services) were classified under the newly created category of (J) Information and communication. Source: http://www.nscb.gov.ph/activestats/psic/technicalnotes.asp

Figure 10 Output and labour productivity in services sub-sectors



Source: PEPM 2012

Figure 10 (continued)

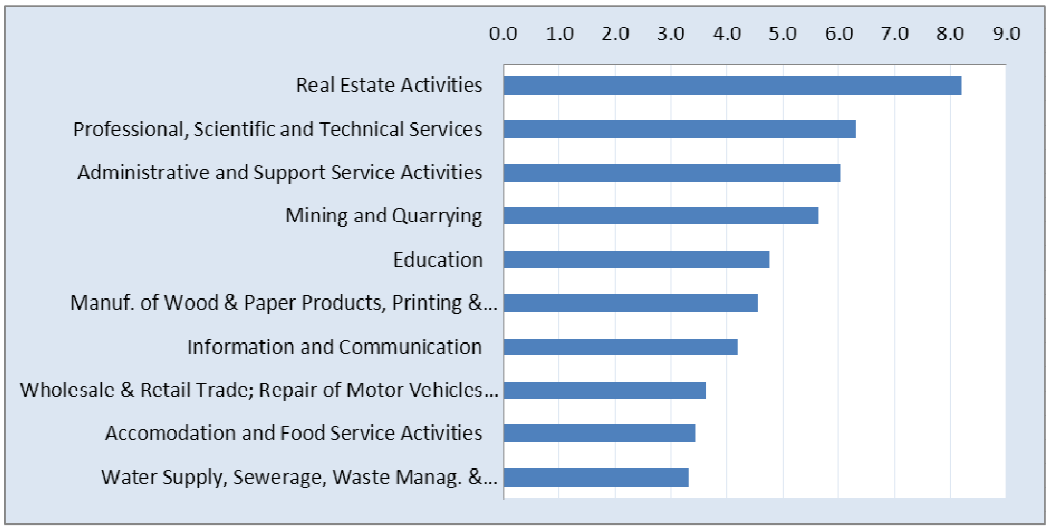


Industry projections, employment growth and employment quality

From a policy perspective, it is important to know which industry sectors have the highest employment generation potential in the medium-term. The PEPM results suggest that most of the Philippines' medium term employment growth will be in the services sector, and the deindustrialization of the past decade will continue. Seven out of the top ten sub-sectors with the highest employment growth rates over the 2010-2016 period are services sub-sectors; while the remaining three are industry sub-sectors, specifically, mining; manufacturing of wood and paper products, printing and publishing; and water supply, sewerage, waste management and remediation (figure 11).

The services sub-sectors with high projected employment growth rates are sub-sectors with relatively high labour productivity and a higher prevalence of decent work opportunities. In particular, among the top sectors with high employment growth rates are services subsectors associated with BPOs and ICT services, such as professional, scientific and technical services; administrative and support services activities; and information and communication. BPOs, ICT services and related knowledge-based services rank high among the government's priority areas in terms of both investment and export promotion, as listed in the 2011 Investment Priorities Plan (IPP, see OPP, 2011) and the Philippines Export Development Plan 2011-2013 (PEDP, see DTI, 2011).

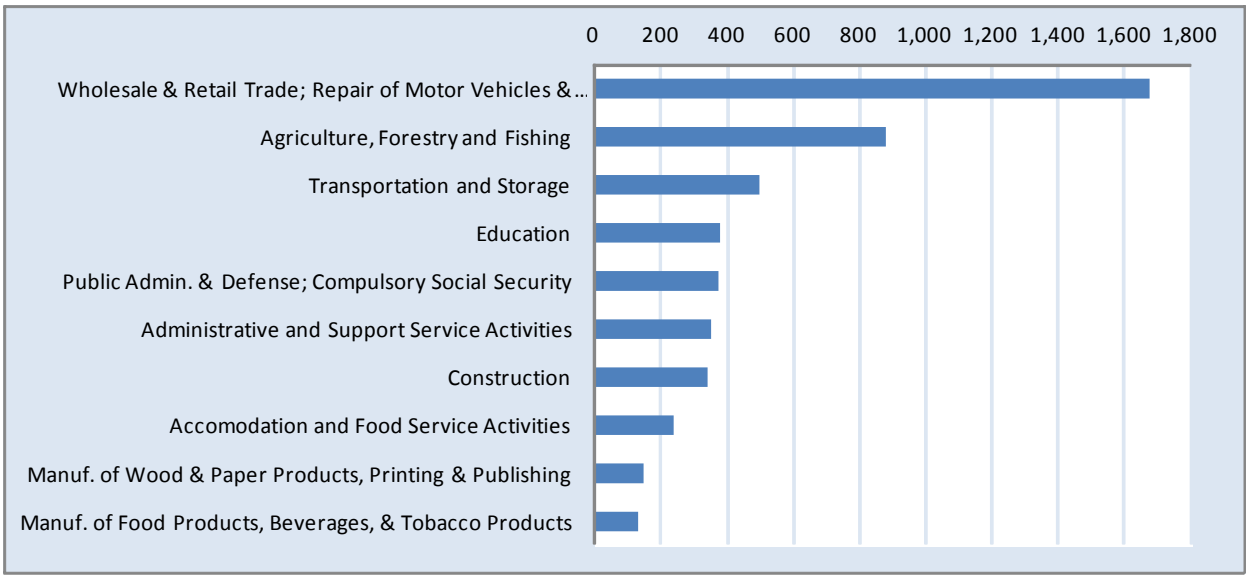
Figure 11 Average annual employment growth (%) - 2010-2016 - Top 10 sectors



Source: PEPM 2012

However, in terms of number of people employed, the wholesale and retail trade sector (including repair of motor vehicles and motorcycles) and the agriculture sector are the two sectors that will continue to absorb the largest share of the Philippines' growing workforce (figure 12). These two subsectors have lower labour productivity and higher shares of vulnerable employment. In the PDP 2011-2016, the government has acknowledged the importance of self-employment for employment generation in the Philippines (as complementary to formal wage employment generation), and committed to support self-employment by providing or facilitating the provision of micro-credit, technical assistance and other business promotion measures to support micro and small and medium enterprises (MSMEs). Agriculture, agribusiness and fisheries also rank high among government priorities for investment and export promotion (IPP 2011 and PEPD 2011-2013).

Figure 12 Employment growth (thousands) - 2010-2016 - Top 10 sectors



Source: PEPM 2012

By 2016, the wholesale and retail trade sector is projected to employ nearly 1.7 million additional workers, and the agriculture, forestry and fisheries sector is projected to employ approximately 900 thousand additional workers. Another half a million additional workers are projected to be employed in transportation and storage.

The public sector is projected to employ a large number of workers. Specifically, more than 370 thousand additional workers would be employed in public administration, defense and compulsory social security. More than 370 additional workers are also expected to be employed in education, in both private and public sectors.

More than 350 thousand additional workers are expected to be employed in administrative and support service activities, and another 340 thousand additional workers are expected to be employed in construction. The accommodation and food services activities sub-sector, which is often associated with tourism, is projected to employ nearly 240 thousand additional workers by 2016. The government's policies to actively promote tourism (with a target of doubling the annual number of tourist arrivals to 6 million by 2016)[33] would therefore support growth in the hotel and restaurants industry, as well as in transportation, arts, recreation and entertainment, and other services.

Table 13 Correlations between LP, VER, and WP

	LP	VER	WPR (1.25$/day)	WPR (2.00$/day)
LP	1.0000			
VER	-0.2654	1.0000		
WPR (1.25$/day)	-0.3726	0.6023	1.0000	
WPR (2.00$/day)	-0.4088	0.6234	0.9725	1.0000

Note: This table shows pairwise correlations between the four variables for all PEPM 2012 sectors over the historical period 2001-2010.

[33] NEDA (2011), Chapter 3, p. 84.

Two manufacturing sub-sectors are among the top 10 sub-sectors in terms of number of additional jobs: wood and paper products, printing and publishing, as well as food products, beverages and tobacco products.

Which sectors or sub-sectors are projected to absorb the largest share of the growing workforce is an important policy consideration. More decent work opportunities are needed to reduce poverty incidence and improve living standards. In general, sectors with higher labour productivity tend to have lower vulnerable employment and poverty rates. As shown in table 13, labour productivity negatively correlates with vulnerable employment and working poverty, while the latter two variables are positively correlated.

Figure 13 LP and VER by sector, 2010

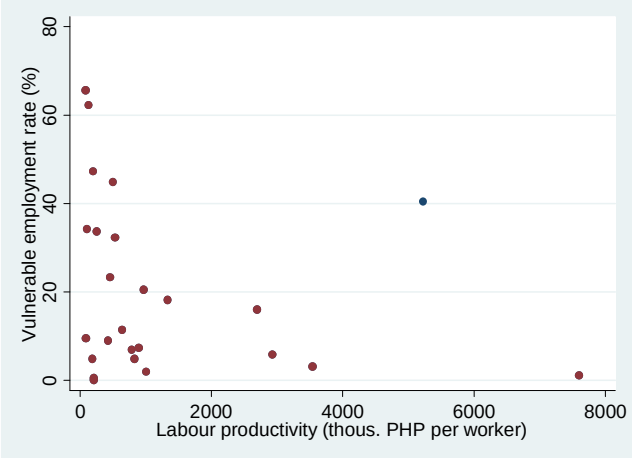
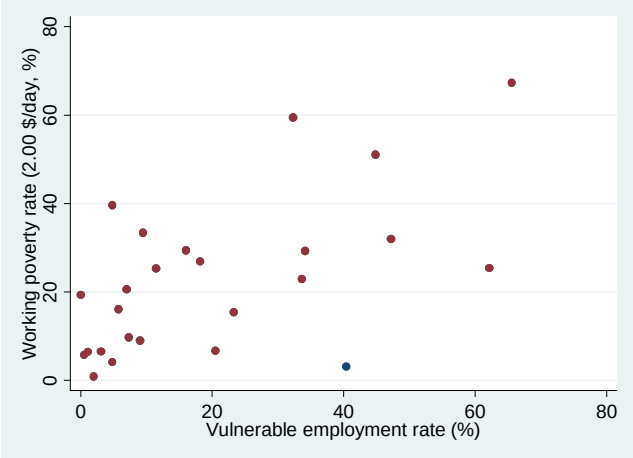
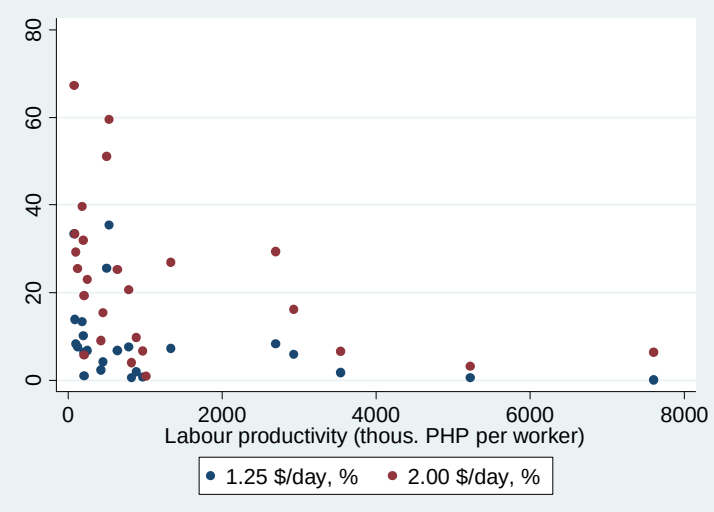


Figure 14 VER and WPR2 by sector, 2010



**Note: Blue dots (outliers) in graphs 7 and 8 represent the Real Estate industry, where own-account workers have high labour productivity and high income.*
Source: PEPM 2012

Figure 15 LP and WPR1, WPR2, by sector, 2010



Source: PEPM 2012

The correlations between labour productivity, vulnerable employment and working poverty are also illustrated in figures 13, 14 and 15. These graphs show that, with the exception of the Real Estate industry, lower levels of labour productivity are associated with higher vulnerable employment rates, which in turn are associated with higher poverty rates. The Real Estate sector is somewhat different as many agents, classified as own-account workers, have high productivity and revenues.

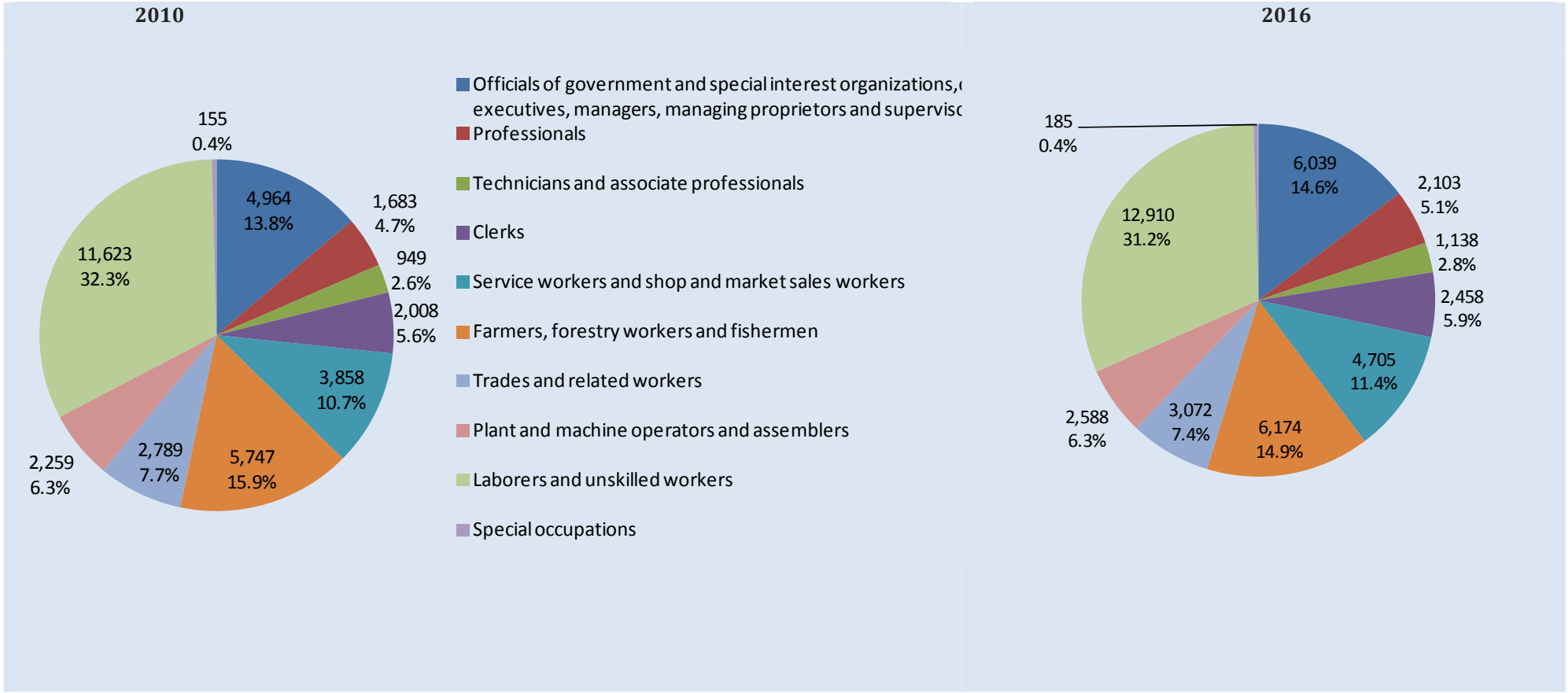
1.3.4. Occupational employment

In 2010, labourers and unskilled workers constituted the largest occupational group in the Philippines, with 11.6 million workers or nearly one third of the country's workers (figure 16). The number of workers in this group is projected to increase to nearly 12.9 million by 2016, but the group's share in employment is projected to decrease to 31.2 per cent. The majority of labourers and unskilled workers (6 million) were employed in agriculture, forestry and fishery, followed by elementary occupations in sales and services (3.8 million) and as labourers in other, mainly industrial sectors (approximately 1.8 million labourers in mining, construction, manufacturing and transport) in 2010 (table 14).

Over the forecast period, labourers in the industry sector are projected to have the highest employment growth rate of the group (2.7 per cent), followed by labourers in services (2.2 per cent), while labourers in agriculture, forestry and fishery are projected to have the slowest employment growth (1.2 per cent). All three subgroups, despite relatively low employment growth rates are among the top 10 subsectors in terms of employment generation potential (figure 18). In particular, by 2016, there are projected to be some 540 thousand additional workers in sales and services elementary occupations, 440 thousand additional labourers in agriculture, forestry and fishery, and 300 thousand additional labourers in industry.

The second largest occupational group, farmers, forestry workers and fishermen, accounted for nearly 16 per cent of employment in 2010 with 5.7 million workers (figure 16). This group's share in employment is projected to decrease by approximately one percentage point over the forecast period, despite an increase of 428 thousand workers. Most of the additional workers (300 thousand) would be farmers and other plant growers (table 14).

Figure 16 Employment by occupation (thousands, and % of total employment)



Source: PEPM 2012

Table 14 Employment by Occupation (thousands)

							Annual or average annual change (%)					
		Actual			Projected		Actual			Projected		
	2001	2008	2009	2010	2011	2016	01-10	08-09	09-10	10-11	11-16	10-16
Officials of government and special interest organizations, corporate executives, managers, managing proprietors and supervisors	**2'915**	**4'318**	**4'710**	**4'964**	**5'108**	**6'039**	**6.1**	**9.1**	**5.4**	**2.9**	**3.4**	**3.3**
Officials of Government and Special-Interest Organizations	251	250	258	271	276	325	0.8	2.9	5.0	1.8	3.4	3.1
Corporate Executives and Specialized Managers	238	244	260	285	291	346	2.0	6.3	9.8	2.2	3.5	3.3
General Managers or Managing-Proprietors	2'155	3'513	3'870	4'092	4'219	4'994	7.4	10.2	5.7	3.1	3.4	3.4
Supervisors	270	310	323	316	322	375	1.8	4.2	-2.3	2.1	3.0	2.9
Professionals	**1'323**	**1'523**	**1'606**	**1'683**	**1'725**	**2'103**	**2.7**	**5.4**	**4.8**	**2.5**	**4.0**	**3.8**
Physicists, Mathematical and Engineering Science Professionals	152	176	187	196	201	235	2.8	6.6	4.5	2.4	3.3	3.1
Life Science and Health Professionals	178	240	260	291	294	317	5.6	8.4	12.2	0.9	1.5	1.4
Teaching Professionals	740	843	890	917	945	1'211	2.4	5.6	3.0	3.0	5.1	4.7
Other Professionals	253	265	269	279	286	340	1.1	1.4	3.8	2.4	3.5	3.3
Technicians and associate professionals	**747**	**872**	**928**	**949**	**971**	**1'138**	**2.7**	**6.4**	**2.3**	**2.3**	**3.2**	**3.1**
Physical Science and Engineering Associate Professionals	190	196	193	194	198	232	0.2	-1.6	0.4	2.0	3.2	3.0
Life Science and Health Associate Professionals	137	157	166	187	190	208	3.6	5.8	12.7	1.4	1.8	1.8
Teaching Associate Professionals	12	49	55	65	66	79	20.8	10.5	18.6	2.5	3.6	3.4
Related Associate Professionals	409	470	514	503	517	619	2.3	9.5	-2.1	2.8	3.7	3.5
Clerks	**1'313**	**1'715**	**1'860**	**2'008**	**2'059**	**2'458**	**4.8**	**8.5**	**7.9**	**2.5**	**3.6**	**3.4**
Office Clerks	944	1'007	1'046	1'082	1'106	1'309	1.5	3.9	3.4	2.3	3.4	3.2
Customer Services Clerks	369	708	814	927	953	1'149	10.8	15.0	13.8	2.8	3.8	3.7
Service workers and shop and market sales workers	**2'593**	**3'411**	**3'690**	**3'858**	**3'969**	**4'705**	**4.5**	**8.2**	**4.5**	**2.9**	**3.5**	**3.4**
Personal and Protective Service Workers	1'267	1'701	1'818	1'895	1'942	2'275	4.6	6.9	4.2	2.5	3.2	3.1
Models, Salespersons and Demonstrators	1'326	1'710	1'872	1'964	2'027	2'430	4.5	9.5	4.9	3.2	3.7	3.6
Farmers, forestry workers and fishermen	**6'353**	**5'999**	**5'851**	**5'747**	**5'842**	**6'174**	**-1.1**	**-2.5**	**-1.8**	**1.7**	**1.1**	**1.2**
Farmers and Other Plant Growers	4'830	4'393	4'288	4'191	4'260	4'499	-1.6	-2.4	-2.3	1.7	1.1	1.2
Animal Producers	516	511	481	514	523	552	0.0	-5.9	7.0	1.7	1.1	1.2
Forestry and Related Workers	70	119	119	111	113	124	5.3	-0.4	-6.4	2.1	1.8	1.9
Fishermen	936	976	963	930	945	998	-0.1	-1.3	-3.5	1.7	1.1	1.2
Hunters and Trappers	1	1	1.0	0.6	0.6	0.6	0.0	0.0	-43.0	1.7	1.1	1.2
Trades and related workers	**3'075**	**2'728**	**2'660**	**2'789**	**2'815**	**3'072**	**-1.1**	**-2.5**	**4.9**	**0.9**	**1.8**	**1.6**
Mining, Construction and Related Trade Workers	1'083	1'065	1'055	1'124	1'160	1'321	0.4	-0.9	6.6	3.2	2.6	2.7
Metal, Machinery and Related Trades Workers	663	665	653	689	701	799	0.4	-1.7	5.4	1.8	2.7	2.5
Precision, Handicraft, Printing and Related Trades Workers	164	124	117	113	113	128	-4.1	-6.1	-3.7	0.8	2.4	2.1
Other Craft and Related Trades Workers	1'165	875	835	863	840	825	-3.3	-4.6	3.4	-2.7	-0.4	-0.8
Plant and machine operators and assemblers	**2'281**	**2'353**	**2'218**	**2'259**	**2'310**	**2'588**	**-0.1**	**-5.7**	**1.8**	**2.3**	**2.3**	**2.3**
Stationary Plant and Related Operators	107	59	61	67	68	79	-5.1	4.0	9.3	1.9	2.9	2.7
Machine Operators and Assemblers	354	426	381	447	440	443	2.6	-10.6	17.4	-1.5	0.1	-0.1
Drivers and Mobile Plant Operators	1'820	1'868	1'776	1'745	1'802	2'066	-0.5	-4.9	-1.8	3.3	2.8	2.9
Laborers and unskilled workers	**8'421**	**11'022**	**11'387**	**11'623**	**11'855**	**12'910**	**3.6**	**3.3**	**2.1**	**2.0**	**1.7**	**1.8**
Sales and Services Elementary Occupations	3'049	3'614	3'743	3'847	3'934	4'383	2.6	3.6	2.8	2.3	2.2	2.2
Agricultural, Forestry, Fishery and Related Laborers	4'310	5'852	5'973	6'000	6'099	6'444	3.7	2.1	0.5	1.7	1.1	1.2
Laborers in Mining, Construction, Manufacturing and Transport	1'063	1'557	1'671	1'776	1'822	2'083	5.9	7.3	6.3	2.6	2.7	2.7
Special occupations	**135**	**147**	**150**	**155**	**159**	**185**	1.6	2.4	3.4	2.1	3.1	2.9
Armed Forces	85	93	92	91	92	109	0.6	-1.4	-1.6	1.9	3.4	3.1
Other Occupations Not Classifiable	49	53	58	65	66	76	3.1	8.9	11.4	2.3	2.7	2.7
Total	**29'156**	**34'089**	**35'061**	**36'035**	**36'813**	**41'373**	**2.4**	**2.9**	**2.8**	**2.2**	**2.4**	**2.3**

Source: PEPM 2012

Another large occupational group is that of officials of government, special interest organizations, corporate executives, managers, managing proprietors and supervisors. This group accounted for nearly 14 per cent of employment in 2010, with some 5 million workers (figure 16). By 2016, it is projected to account for nearly 15 per cent of employment or 6 million workers. The largest subgroup within this occupational group consists of general managers and managing proprietors (approximately 4 million workers in 2010, or four out of five of the occupational groups' workers). This is worth noting because the subgroup includes both managers of large firms and SMEs in the formal sector, as well as micro-enterprises run by own-account workers, often in the informal sector. Although this occupational subgroup is associated with a higher skills level,[34] workers in this group may differ significantly in actual levels of educational attainment and working conditions. General managers and managing proprietors is the subgroup projected to have the fasted annual growth rate over the forecast period (3.4 per cent) for the occupational group, while supervisors are projected to have the lowest annual growth rate with 2.9 per cent (table 14). The general managers and managing proprietors subgroup is projected to account for the largest absolute increase in employment, with more than 900 thousand additional workers by 2016 (figure 18).

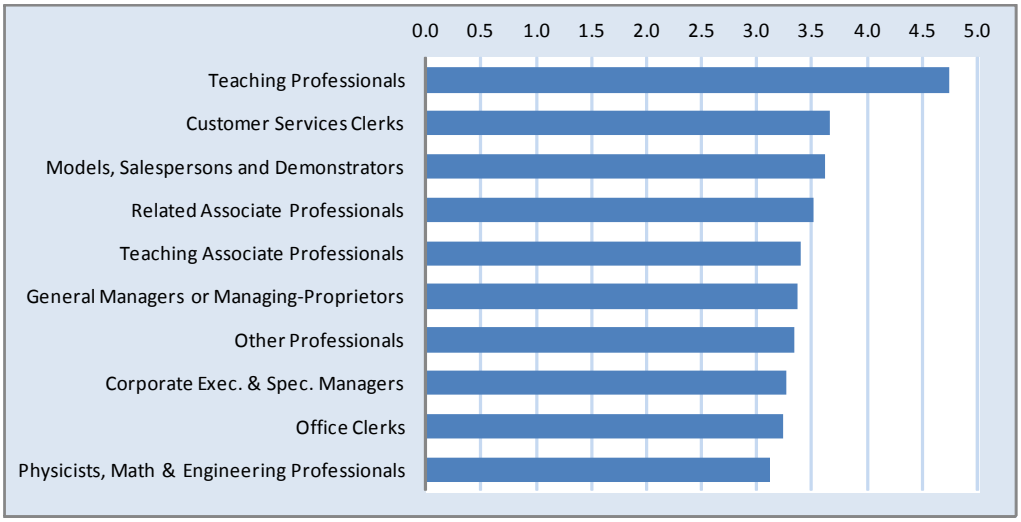
Nearly 1.7 million professionals and some 950 thousand technicians and associate professionals were employed in 2010, representing respectively 4.7 per cent and 2.6 per cent of workers in the Philippines (figure 16). By 2016, over 2.1 million professionals and 1.1 million technicians and associate professionals are projected to be employed.

Professionals' share in employment would therefore increase to 5.1 per cent, and that of technicians and associate professionals would increase to 2.8 per cent by 2016. Employment growth in this occupational group is projected to be driven primarily by rapid growth in the teaching professionals and associates professionals' subgroups (table 14). In particular, the teaching professionals' subgroup is the occupational subgroup with the highest projected employment growth rate over the forecast period (figure 17) and is also among the top 10 occupational subgroups in terms of employment generation potential, with nearly 300 thousand additional workers by 2016 (figure 18). Note that the other professional and associate professional subgroups are also among the 10 subgroups with highest employment growth rate projections over the forecast period (figure 17), but are not as prominent in terms of projected net employment generation (not among the top 10 in terms of number of jobs created, figure 18). These trends seem broadly in line with shifts in the occupational distribution towards higher-skilled occupations in many developing economies, despite the fact that these jobs still account for a relatively low share in employment (ILO, 2011b).

In terms of employment generation, the top 10 occupational subgroups include several other subgroups in the services sector, specifically: models, salespersons and demonstrators (more than 460 thousand additional workers by 2016), personal and protective services (380 thousand additional workers), and office clerks (approximately 230 thousand additional workers) (figure 18). Among industry sector occupations, the subgroup with the largest employment generation potential is that of drivers and mobile plant operators, with more than 320 thousand additional workers by 2016 (figure 18).

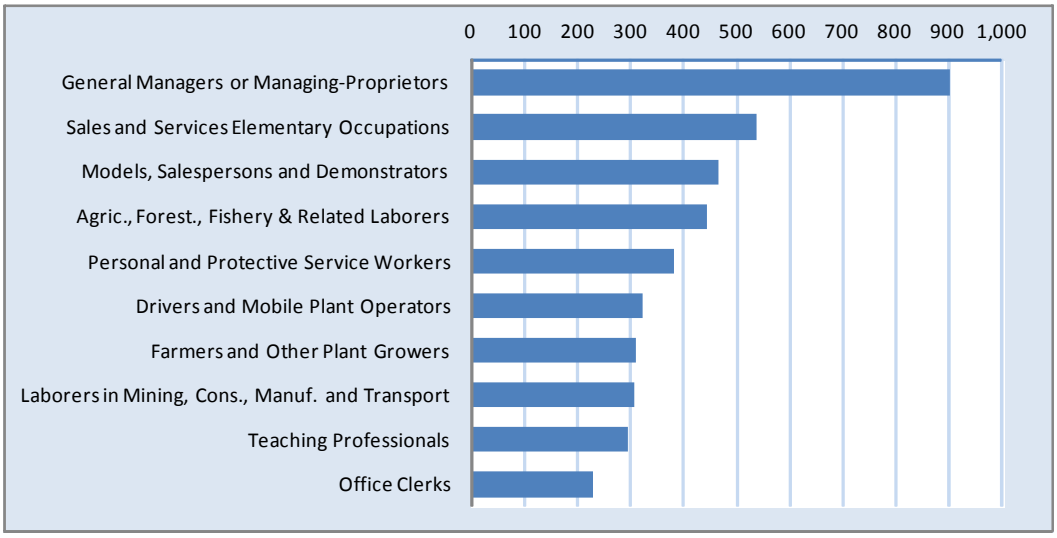
[34] See Section 2.1 for a discussion of skills issues.

Figure 17 Average annual employment growth (%) - 2010-2016 - Top 10 occupational subgroups



Source: PEPM 2012

Figure 18 Employment growth (thousands) - 2010-2016 - Top 10 occupational subgroups



Source: PEPM 2012

2. Policy scenarios and applications

This section presents applications of EPMs to inform employment and labour policies. Specifically, it illustrates the use of the models to project and analyse the issue of skills mismatch and to simulate potential labour market impacts of a change in fiscal policy. Even though the issue of skill mismatch has received renewed attention in the advanced economies due to the economic crisis (ILO, 2013), the formulation and implementation of effective education and training policies, including responsive education and training systems, is a continuous challenge for all countries. Meeting this challenge requires not only linking skills development with employment and economic development, and involving social partners and key stakeholders in skills development systems, but also effective labour market information and analysis systems. One of the outputs of such systems can be projections of skills mismatch which inform education and skills policies. Similarly, employment projections models can be used to produce a credible projection of the impact of macroeconomic policies, within the constraints set by the model at hand.

2.1. Skills mismatch

Confronted with consistently high unemployment, despite growing employment opportunities, policymakers often face the issue of skills mismatch. Skills mismatch – when skills supply does not correspond to skills demand in an industry or in the economy as a whole – may indeed cause unemployment rates to remain high, as firms are reluctant to hire workers without adequate skills or qualifications, preferring to leave certain positions vacant or else hire workers from abroad.[35] Skills and qualifications mismatch does not only lead to high unemployment however, but may also exist in the form of workers employed in occupations that underutilise their skills set (overqualified workers) or in occupations normally requiring skills that they do not possess (under-qualified workers). In both cases, this skill mismatch affects job satisfaction and wages of individual workers, as well as the productivity of firms. It may also lead to increases in turnover of staff (Quintini, 2011).

In line with much of the literature, in this paper education (level of schooling) is used as a proxy for skills, and three levels of educational attainment are distinguished: less than secondary, secondary and tertiary. Therefore, an important and highly relevant factor with respect to the skills mismatch issue is the quality of education. However, available data do not reflect the quality of education. An Asian Development Bank (ADB) study on education and structural change in four Asian economies, including the Philippines, highlighted the need for labour force surveys to collect data on school attributes in order to allow for an analysis of the impact of education quality on labour market outcomes (ADB, 2007b). Nevertheless, available LFS data over the historical periods and PEPM projections over the forecast period allow significant insights and analysis of the skills mismatch issue.

The so-called 'normative' approach to skills mismatch has been adopted in this paper to measure skill mismatch. In this approach, mismatch is determined based on the presumed correspondence between education levels and major occupational groups (see

[35] A situation in which the demand and supply for skills do not match is often characterized by a 'skill shortage' or 'skill surplus', while 'skill mismatch' is used with reference to job characteristics (e.g. Quintini, 2011, Table 1). As discussed in the main text, skill mismatch is used in a broad sense in this paper, but nevertheless in relation to the requirements of jobs.

e.g. ILO, 2011b, box 5a). Alternative approaches such as the 'statistical' and 'self-declared' method seem less appropriate in the context of employment projection models.[36]

In addition, a distinction is made between 'actual' mismatch and 'potential' mismatch. Actual mismatch is a measure of the number or share of workers employed in occupations requiring a different skill level than they possess, resulting in three categories of workers ('no mismatch'; 'overqualified'; and 'underqualified').[37] The *shares* of these three categories have been calculated over the historical period, and the actual mismatch distribution over the forecast period is obtained by linearly projecting these shares in accordance with the sectoral employment projections.

Potential mismatch also refers to the number of workers who are either employed in occupations for which they have the adequate skills level, are under-qualified, or are overqualified for their positions, but in this case mismatch is calculated on the basis of trends in supply and demand. The skills distribution of workers (skills supply) is determined for the historical period and compared with the skills distribution that is required by the occupational distribution (skills demand),[38] resulting again in three categories of workers ('no mismatch'; 'overqualified'; and 'underqualified'). Similarly, potential mismatch is obtained over the forecast period by subtracting demand (obtained from translating the forecasted employment by occupation from the PEPM into their associated levels of educational attainment) from supply (obtained by linearly projecting the skills distribution of workers for each industry.[39]

[36] The 'statistical' method is based on the actual distribution of education of workers in each occupation, while the 'self-declared' method is based on workers' views regarding the match between their education and their job (Hartog, 2000). Both methods rely on information that is not readily available for future years.

[37] For each industry j, actual mismatch is calculated as:

$$Actmism_j = \sum_i (o_i + u_i) \qquad where\ i = \{1,2,3\}$$

where o_i and u_i represent the number of workers with skills level i, who are over- and under-qualified, respectively.

[38] For each industry j, potential mismatch is calculated as:

$$Potmism_j = \begin{cases} \sum_i (s_i - d_i) & if\ s_i > d_i \quad where\ i = \{1,2,3\} \\ 0 & if\ s_i < d_i \end{cases}$$

where s_i and d_i represent the supply and demand of workers at skills level *i*. Note that when demand exceeds supply for a skill level, potential mismatch is set to zero.

[39] Potential mismatch comes closer to the concept of skill shortage as usually discussed in the literature.

Table 15 Working-age population, labour force, employed, and skills mismatch by skill levels (thousands of persons)

							Annual or average annual change (%)					
	Actual				*Projected*		*Actual*			*Projected*		
	2001	2008	2009	2010	2011	2016	01-10	08-09	09-10	10-11	11-16	10-16
Working-age population	**48'929**	**57'848**	**59'237**	**60'717**	**62'201**	**69'614**	**2.4**	**2.4**	**2.5**	**2.4**	**2.3**	**2.3**
Less than secondary	25'938	27'412	27'468	27'556	27'781	28'079	0.7	0.2	0.3	0.8	0.2	0.3
Secondary completed	10'704	14'469	14'982	15'620	16'331	19'877	4.3	3.5	4.3	4.6	4.0	4.1
Tertiary	12'286	15'967	16'788	17'540	18'089	21'659	4.0	5.1	4.5	3.1	3.7	3.6
Labour force	**31'356**	**36'805**	**37'892**	**38'893**	**39'788**	**44'492**	**2.4**	**3.0**	**2.6**	**2.3**	**2.3**	**2.3**
Less than secondary	16'182	17'013	17'187	17'170	17'352	17'541	0.7	1.0	-0.1	1.1	0.2	0.4
Secondary completed	7'249	9'529	9'822	10'314	10'688	12'869	4.0	3.1	5.0	3.6	3.8	3.8
Tertiary	7'925	10'263	10'882	11'409	11'748	14'082	4.1	6.0	4.8	3.0	3.7	3.6
Unemployed	**2'200**	**2'716**	**2'831**	**2'859**	**2'974**	**3'119**	**3.0**	**4.2**	**1.0**	**4.1**	**1.0**	**1.5**
Less than secondary	715	732	733	750	798	677	0.5	0.1	2.4	6.3	-3.2	-1.7
Secondary completed	657	899	936	930	1'020	1'274	3.9	4.2	-0.6	9.6	4.6	5.4
Tertiary	828	1'086	1'162	1'178	1'157	1'168	4.0	7.1	1.3	-1.8	0.2	-0.1
Employed	**29'156**	**34'089**	**35'061**	**36'035**	**36'813**	**41'373**	**2.4**	**2.9**	**2.8**	**2.2**	**2.4**	**2.3**
Less than secondary	15'467	16'281	16'455	16'420	16'554	16'864	0.7	1.1	-0.2	0.8	0.4	0.4
Secondary completed	6'592	8'630	8'886	9'384	9'668	11'595	4.0	3.0	5.6	3.0	3.7	3.6
Tertiary	7'097	9'178	9'720	10'231	10'592	12'914	4.1	5.9	5.3	3.5	4.0	4.0
Employed - No mismatch (potential)	**19'459**	**25'201**	**26'279**	**27'177**	**27'859**	**32'047**	**3.8**	**4.3**	**3.4**	**2.5**	**2.8**	**2.8**
Less than secondary	8'305	10'628	10'953	11'139	11'306	12'068	3.3	3.1	1.7	1.5	1.3	1.3
Secondary completed	6'503	8'355	8'605	9'068	9'320	11'139	3.8	3.0	5.4	2.8	3.6	3.5
Tertiary	4'652	6'218	6'721	6'970	7'232	8'839	4.6	8.1	3.7	3.8	4.1	4.0
Employed - Over qualified (potential)	**2'530**	**3'215**	**3'260**	**3'554**	**3'684**	**4'500**	**3.8**	**1.4**	**9.0**	**3.7**	**4.1**	**4.0**
Less than secondary	0	0	0	0	0	0						
Secondary completed	85	255	261	292	325	425	14.7	2.4	12.2	11.2	5.5	6.4
Tertiary	2'445	2'960	2'999	3'261	3'359	4'075	3.3	1.3	8.7	3.0	3.9	3.8
Employed - Under qualified (potential)	**7'166**	**5'673**	**5'522**	**5'304**	**5'271**	**4'826**	**-3.3**	**-2.7**	**-3.9**	**-0.6**	**-1.7**	**-1.6**
Less than secondary	7'162	5'653	5'502	5'281	5'248	4'795	-3.3	-2.7	-4.0	-0.6	-1.8	-1.6
Secondary completed	4	20	21	24	23	31	20.3	2.0	14.3	-2.4	5.9	4.5
Tertiary	0	0	0	0	0	0						
Employed - No mismatch (actual)	**12'702**	**15'522**	**16'044**	**16'429**	**16'907**	**19'187**	**2.9**	**3.4**	**2.4**	**2.9**	**2.6**	**2.6**
Less than secondary	5'808	7'124	7'344	7'351	7'626	8'364	2.7	3.1	0.1	3.7	1.9	2.2
Secondary completed	3'873	4'441	4'467	4'677	4'720	5'222	2.1	0.6	4.7	0.9	2.0	1.9
Tertiary	3'021	3'956	4'232	4'400	4'561	5'601	4.3	7.0	4.0	3.7	4.2	4.1
Employed - Over qualified (actual)	**5'997**	**8'149**	**8'515**	**9'019**	**9'427**	**11'563**	**4.6**	**4.5**	**5.9**	**4.5**	**4.2**	**4.2**
Less than secondary	0	0	0	0	0	0						
Secondary completed	1'922	2'927	3'027	3'188	3'396	4'250	5.8	3.4	5.3	6.5	4.6	4.9
Tertiary	4'075	5'221	5'488	5'831	6'030	7'313	4.1	5.1	6.3	3.4	3.9	3.8
Employed - Under qualified (actual)	**10'457**	**10'418**	**10'502**	**10'587**	**10'480**	**10'623**	**0.1**	**0.8**	**0.8**	**-1.0**	**0.3**	**0.1**
Less than secondary	9'659	9'156	9'111	9'068	8'928	8'500	-0.7	-0.5	-0.5	-1.5	-1.0	-1.1
Secondary completed	798	1'262	1'391	1'518	1'552	2'124	7.4	10.3	9.1	2.2	6.5	5.8
Tertiary	0	0	0	0	0	0						

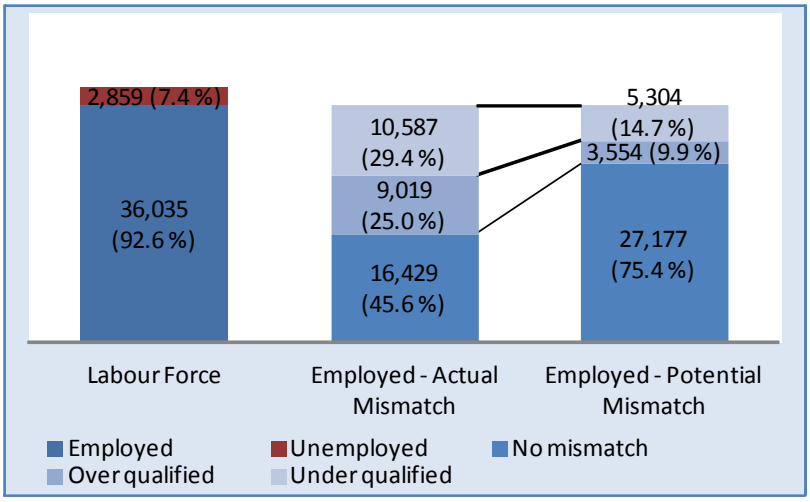
Source: PEPM 2012 and El Achkar Hilal (2012).

Table 15 presents the skills distributions of the working-age population, labour force, employed and unemployed, as well as the two measures of skills mismatch: potential mismatch and actual mismatch. Similar to the skills distribution of the employed, the skills distribution of the labour force and the working-age population (at the national level) are projected over the forecast period using linear trends. The skills distribution of unemployed workers is obtained by calculating the number of unemployed as a residual from the labour force and the employed at each skill level.

Note that in general actual mismatch is higher than potential mismatch, because although the overall supply and demand of skills in an industry may not be too far apart (limited or no potential mismatch), many workers in that industry may not have the skills levels associated with their respective occupations (significant actual skills mismatch).

In 2010, out of the 36 million workers in the Philippines, approximately 46 per cent were employed in occupations that normally require their skill level, 25 per cent were overqualified for their occupations, and some 29 per cent were under-qualified (figure 19). Based on the overall skills demand and supply in the economy however, 75 per cent should have been working in occupations that correspond to their skill level, while 10 per cent would have been overqualified, and only 15 per cent should have been under-qualified. In other words, actual skills mismatch was approximately 54 per cent of employment, while potential mismatch was only approximately 25 per cent of employment in 2010.

Figure 19 Actual and potential skills mismatch in employment (2010)



Source: PEPM 2012

How did skills mismatch evolve over time in the Philippines? Between 2001 and 2010, both actual and potential skills mismatch decreased as a share of employment. This has been driven by a decline in the share of under-qualified workers in total employment, which has offset the increase in the share of overqualified workers. However, the decrease in actual mismatch (2 percentage points) was lower than the decrease in potential mismatch (9 percentage points) (table 16). This is because the increase in the share of actual overqualified workers (4 percentage points) was higher than the increase in the share of potential overqualified workers (1 percentage point), while the decrease in actual under-qualified workers (6 percentage points) was lower than the decrease in potential under-qualified workers (10 percentage points).

This suggests that although higher skilled jobs are being created that should absorb a labour force with increasing educational attainment (thus decreasing potential mismatch), in reality, some barriers are preventing a more efficient allocation of labour whereby workers are employed in occupations that correspond to their skills levels (causing actual mismatch

to decrease at a slower pace). Such barriers may include, for instance, hiring processes that are based on personal connections as opposed to merit, or that value professional experience more than educational achievement.

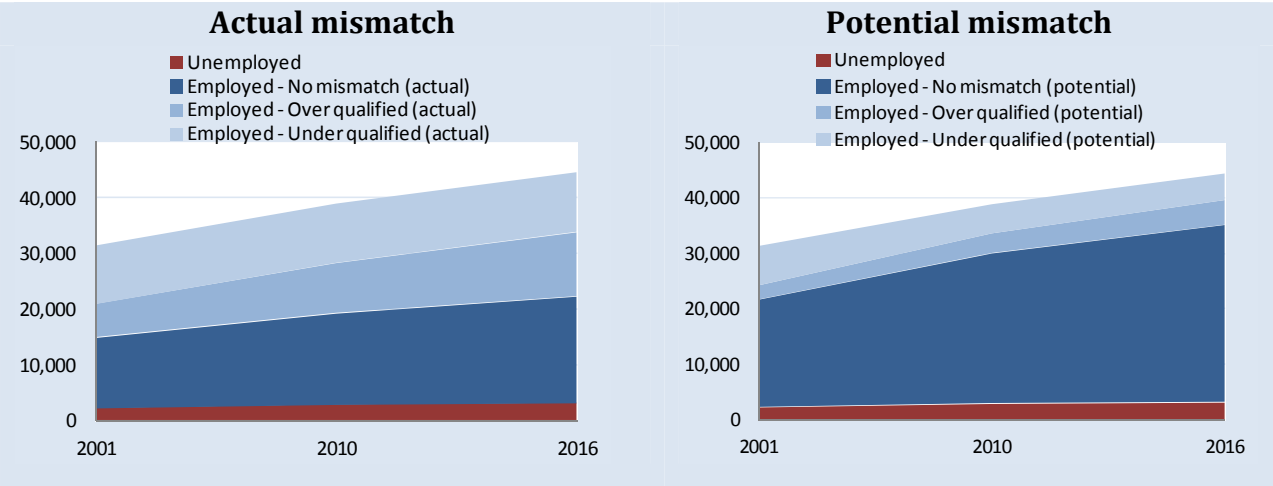
Table 16 Skills mismatch (% of employed, 2001-2016)

	2001		2010		2016		Change (2001-2010)		Projected change (2010-2016)	
	Actual	Potential	Actual	Potential	Actual	Potential	Actual	Potential	Actual	Potential
No mismatch	44%	67%	46%	75%	46%	77%	2%	9%	1%	2%
Mismatch	56%	33%	54%	25%	54%	23%	-2%	-9%	-1%	-2%
Over qualified	21%	9%	25%	10%	28%	11%	4%	1%	3%	1%
Under qualified	36%	25%	29%	15%	26%	12%	-6%	-10%	-4%	-3%

Source: PEPM 2012

Over the forecast period, skills mismatch is projected to continue declining, but at a slower rate. The share of overqualified workers is projected to continue increasing, and that of under-qualified workers to continue decreasing (figure 20). Actual mismatch is only projected to decrease by 1 percentage point, while potential mismatch is projected to decrease by 2 percentage points between 2010 and 2016 (table 16).

Figure 20 Actual and potential skills mismatch (2001-2016)



Source: PEPM 2012

Two indices are constructed to represent summary measures of the potential skills mismatch: the skills mismatch index (SMI)[40] and the dissimilarity index (DI). These are calculated as follows:

$$SMI = \sum_i \left(\frac{s_i}{S} - \frac{m_i}{M}\right)^2 \qquad \text{where } i = \{1,2,3\}$$

[40] The skills mismatch index (SMI) is based on the approach used by Estevão and Tsounta (2011) to assess skills mismatch in the United States using state level data and information.

$$DI = \frac{1}{2}\sum_{i} \text{abs}\left(\left(\frac{s_i}{S} - \frac{m_i}{M}\right)\right) \quad \text{where } i = \{1.2.3\}$$

where s_i is supply of skill level i and m_i is demand for skill level i, and S and M are total supply and total demand respectively.

Table 17 Skills mismatch indices

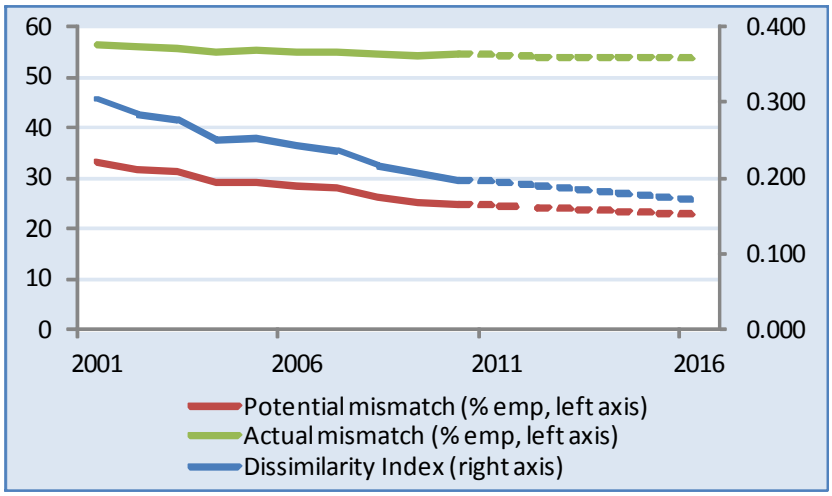
	Actual				*Projected*	
	2001	**2008**	**2009**	**2010**	**2011**	**2016**
SMI	1628	784	687	643	603	452
SMI*	1489	717	641	588	562	434
DI	0.317	0.225	0.211	0.205	0.199	0.174
DI*	0.304	0.217	0.205	0.197	0.193	0.170

Source: PEPM 2012

**Using labour force instead of working-age population for the supply side*

The dissimilarity index may be easier to interpret as it ranges from 1 (perfect dissimilarity or mismatch) to 0 (perfect match). Two versions of these indices are calculated, one using the working age-population for the supply side, the other using the labour force for the supply side. Both indices suggest a decline in skills mismatch over the historical period, continuing over the forecast period (table 17). As the two indices are based on the relative shares of supply and demand for each skill level, and are therefore measures potential mismatch, they may be underestimating actual mismatch. Indeed, as shown in figure 21 the decrease in potential mismatch as a share of employment, which is represented also by the dissimilarity index, is faster over time than the decrease of actual mismatch as a share of employment.

Figure 21 Skills mismatch and dissimilarity index (2001-2016)



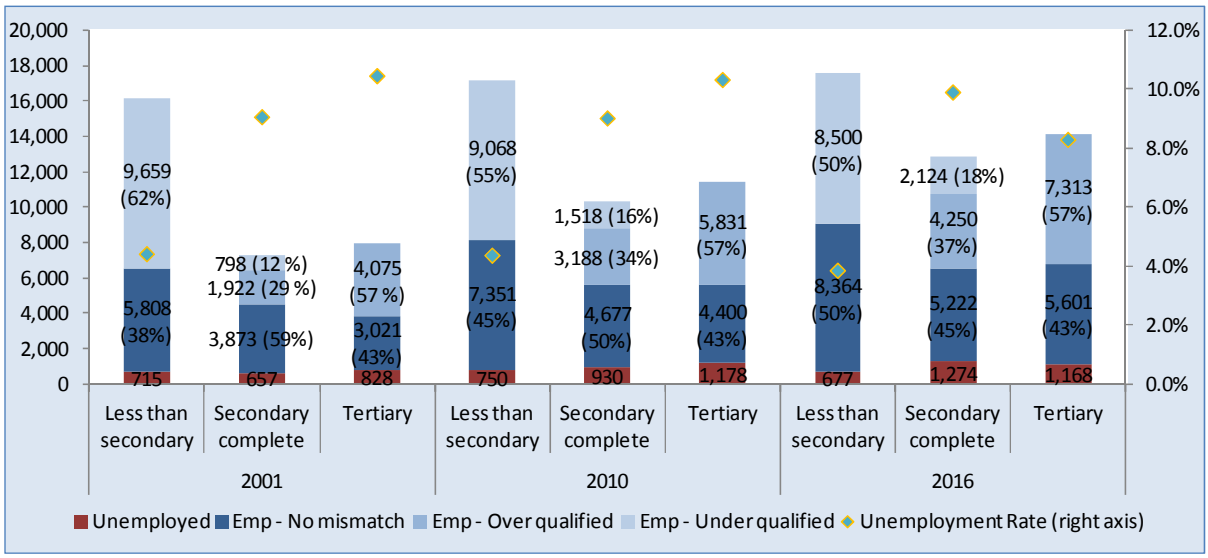
Source: PEPM 2012

Skills mismatch by educational attainment[41]

The breakdown of unemployment and actual skills mismatch categories by educational attainment is also insightful. In general, the unemployment rate increases with the level of educational attainment. This is because higher skilled people are more likely to remain unemployed instead of taking up any kind of employment. In 2010, the unemployment rate was 4.4 per cent for people with less than secondary school attainment, 9 per cent for those who had completed secondary school, and 10.3 per cent for people with tertiary education (figure 22). These rates had remained more or less constant since 2001.

Some 55 per cent of workers with lower than secondary educational attainment were under-qualified for their occupations in 2010 (figure 22). Under-qualified workers with less than secondary school have declined since 2001 both in numbers and as a share of workers with this level of educational attainment. Half of workers with completed secondary school education were employed in occupations requiring their skills level in 2010 (down from 59 per cent in 2001), 34 per cent were overqualified (up from 29 per cent in 2001) and 16 per cent were under-qualified (up from 12 per cent in 2001). For this educational attainment group, the trend of increasing mismatch is projected to continue over the forecast period, with 38 per cent of the group's workers being overqualified, and 18 per cent under-qualified in 2016. Finally, among workers with tertiary level of educational attainment, 43 per cent were employed in occupations corresponding to their skills level and 57 per cent were overqualified in 2010; these rates had stayed constant since 2001 and are projected to remain constant over the forecast period.

Figure 22 Skills mismatch by level of educational attainment (2001, 2010, and 2016)



Source: PEPM 2012

Overall, the results suggest that while the educational attainment of the workforce is increasing over time, so are the skills requirements of jobs, with mixed results in terms of skills mismatch. As the share of workers with secondary and tertiary education grows, these workers are increasingly likely (for those who have completed secondary school) or just as likely (for those with tertiary education) to be employed in occupations that do not correspond to their skills levels. In addition to the increase in skills mismatch, the labour force with completed secondary school is projected to have a higher unemployment rate in

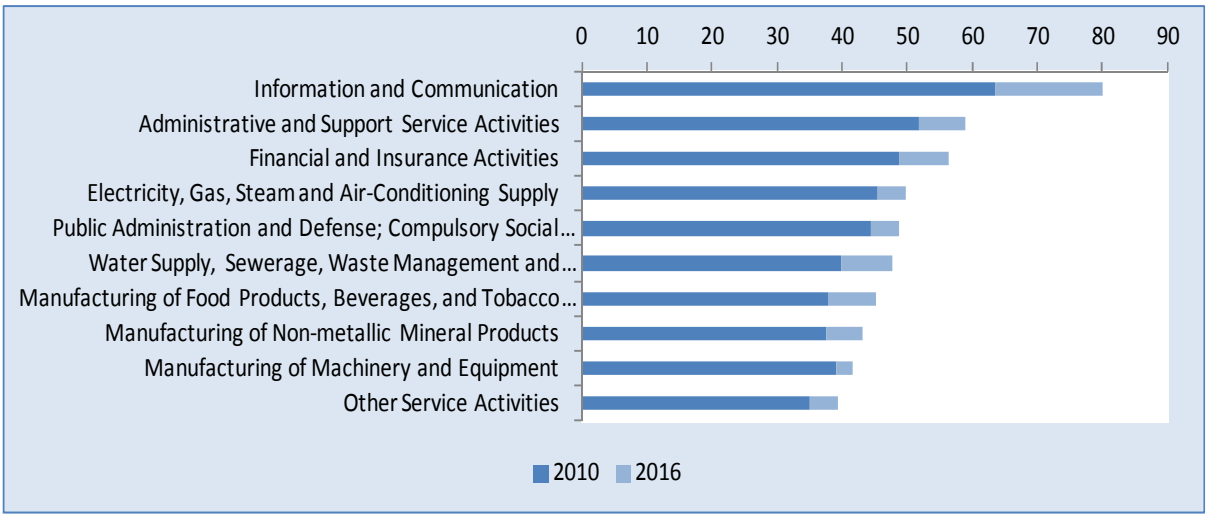
[41] In this section skills mismatch refers to actual mismatch.

2016. However, although workers with tertiary education are projected to be as likely to be overqualified in 2016, than they were in 2010, the unemployment rate of the labour force with tertiary education is projected to decrease by 2016. These findings are interesting to analyse in light of previous study findings that in general the economy-wide returns to basic education (increase in wages associated with an additional year of schooling) have declined at most levels of primary and secondary school, but have been increasing at the tertiary level, despite a growing supply of college educated workers (ADB, 2007b).

Skills mismatch by industry[42]

Which industry sectors have a higher prevalence of skills mismatch? A large share of overqualified workers in an industry may suggest insufficient opportunities (and therefore significant competition for jobs) for higher skilled workers in that industry or in related industries. A large share of under-qualified workers may suggest that educational systems are not producing a sufficient number of graduates in certain disciplines, or point to a recruitment process where skills credentials are less valued than experience or personal connections for instance.

Figure 23 Industries with largest share of overqualified workers - 2010 and 2016



Source: PEPM 2012

In 2010, the sub-sectors with the largest shares of overqualified workers were information and communication (63 per cent), administrative and support service activities (52 per cent) and financial and insurance activities (49 per cent) (figure 23). Approximately 45 per cent of workers in public administration and defense were also overqualified, as well some 45 per cent of workers in electricity, gas, and steam, and some 40 per cent of workers in water supply, sewerage and waste management and remediation activities. Three manufacturing subsectors were also among the 10 industries with largest share of overqualified workers: food products, beverages and tobacco products; non-metallic mineral products; and machinery and equipment. These industries are forecast to have even larger shares of overqualified workers by 2016. In particular, if current trends continue, some 80 per cent of workers in information and communication would be overqualified in 2016. In general, these findings are consistent with the conclusions of the above-mentioned ADB study, that the supply of highly educated workers is growing faster than the number of job opportunities in the sectors that traditionally employ them (ADB, 2007b). As a

[42] In this section skills mismatch refers to actual mismatch.

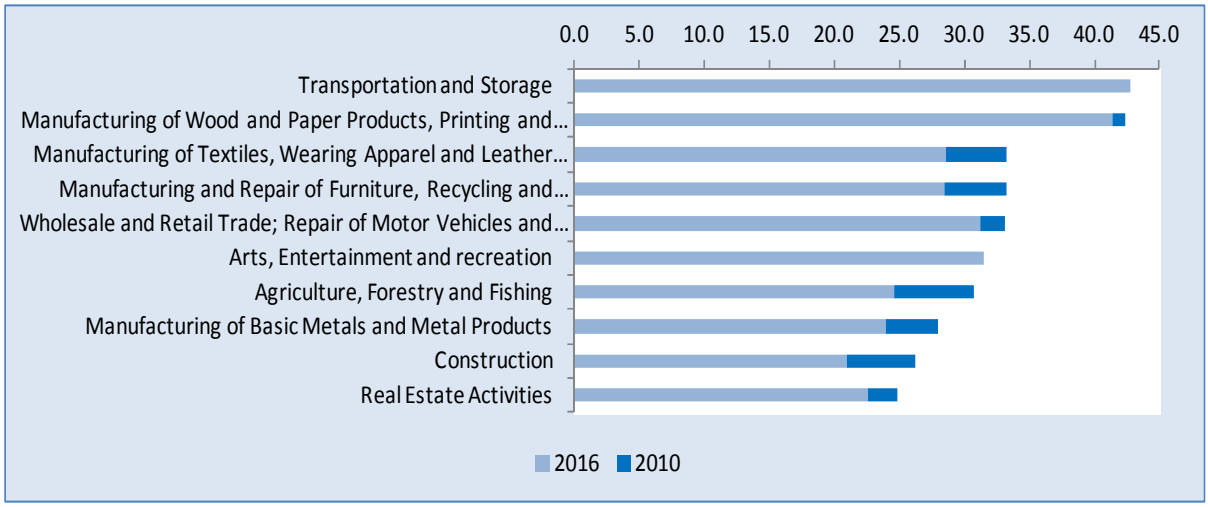
result, they may be overqualified for the positions they hold within these industries, or instead, find work in other sectors where they are also overqualified.

The industry with the largest shares of under-qualified workers (approximately 43 per cent) was transportation and storage in 2010 (figure 24). The share of under-qualified workers in that industry is projected to remain unchanged in 2016. Several manufacturing subsectors were among the industry subsectors with the largest share of under-qualified workers: wood and paper products (42 per cent); textiles, wearing apparel and leather products (33 per cent); repair of furniture, recycling and other manufacturing industries not elsewhere classified (33 per cent); and basic metals and metal products (28 per cent). The share of under-qualified workers in these subsectors is projected to be smaller in 2016.

Approximately a third of workers in wholesale and retail trade and 31 per cent of workers in agriculture, forestry and fishing were under-qualified in 2010 (figure 24). The share of these workers is projected to decrease by 2016. Some 31 per cent of workers in arts, entertainment and recreation were under-qualified in 2010; this share is projected to remain almost constant in 2016. The share of under-qualified construction sector workers is projected to decrease from 26 per cent in 2010 to 21 per cent in 2016. The share of under-qualified real estate workers is also projected to decrease from 25 per cent in 2010 to approximately 23 per cent in 2016.

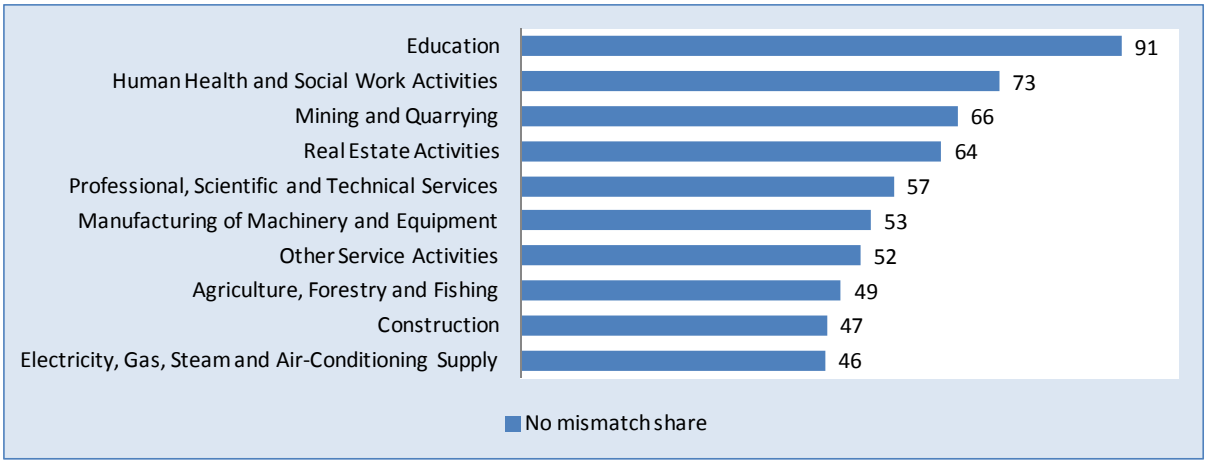
The sectors with the lowest skills mismatch share are education and health and social work activities, where more than 90 per cent of workers and 73 per cent of workers respectively are employed in occupations that correspond to their skills levels (figure 25). Large shares of workers in mining and quarrying (66 per cent), real estate (64 per cent), professional, scientific and technical services (57 per cent) and manufacturing of machinery and equipment (52 per cent) are also employed at their skills levels. Nearly half of workers in agriculture, forestry and fishing, 47 per cent in construction and 46 per cent in electricity, gas and steam are also in occupations that match their skills levels.

Figure 24 Industries with largest share of under qualified workers - 2010 and 2016



Source: PEPM 2012

Figure 25 Industries with the largest share of workers employed at their skill level (no mismatch) - 2010 and 2016



Source: PEPM 2012

Some of the sectors with the lowest skills mismatch share (education; health; professional, scientific and technical services) are the ones where a large part of the workforce consists of highly skilled professionals or associate professionals and technicians, while other sectors with low mismatch rates employ more labourers and unskilled workers or plant and machine operators (construction; manufacturing of machinery and equipment). Indeed, nearly all professionals and 72 per cent of technicians and associate professionals possessed the skills required by their occupational group in 2010 (table 18), which is partly due to the influence of licensing among professionals and associate professionals. Some 63 per cent of labourers and unskilled workers, and 42 per cent of plant and machine operators had the appropriate skills level for their respective occupational groups. The relatively high shares of underqualified workers in occupational groups such as trades and related workers as well as plant and machine operators may reflect the importance of on-the-job training and experience as opposed to educational attainment.

Table 18 Skills mismatch by occupational group (2010)

	No mismatch	Overqualified	Under-qualified
Officials of government and special interest organizations,corporate executives, managers, managing proprietors and supervisors	41.0	0.0	59.0
Professionals	99.6	0.0	0.4
Technicians and associate professionals	71.1	0.0	28.9
Clerks	13.7	79.8	6.5
Service workers and shop and market sales workers	38.3	37.2	24.5
Farmers, forestry workers and fishermen	16.9	8.7	74.5
Trades and related workers	36.3	18.2	45.4
Plant and machine operators and assemblers	42.0	24.7	33.2
Laborers and unskilled workers	62.8	37.2	0.0
Special occupations	31.0	69.0	0.0
All Occupations	**45.6**	**25.0**	**29.4**

Source: PEPM 2012

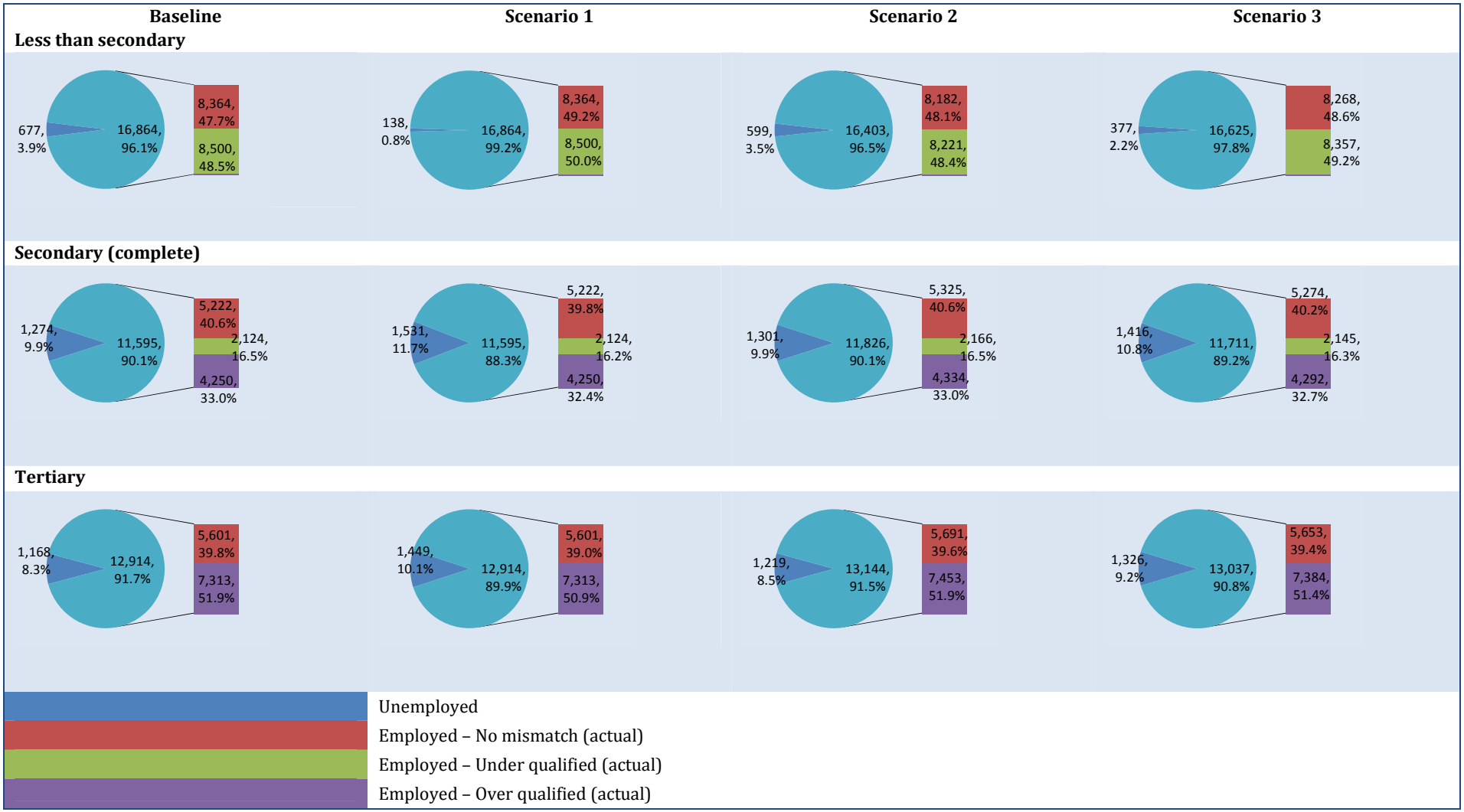
Skills mismatch scenarios: Faster rise in educational attainment of the labour force

The PDP 2011-2016 focuses on increasing participation and standards in basic education, but also emphasizes the importance of higher education and science and technology for attracting high-value added, productive activities including BPO activities and activities in industry. For instance, while BPOs were first introduced in the Philippines as call centres, the industry has evolved towards higher value 'non-voice BPO' functions such as finance and accounting, human resource and administrative services, and recent years have seen significant growth in knowledge process outsourcing (KPO) such as research and analysis functions and legal services (NEDA, 2011). An increase in the highly skilled labour force is needed for the Philippines "to climb the value-added ladder in sectors where it possesses global competitive potential" (NEDA 2011, p. 31). Such policy implications should be treated with caution however, in light of the findings above, and conclusions from previous studies: although the output share of the 'knowledge economy' is increasing fast, the employment shares of these sectors are growing more slowly, or growing from a low base. As a result, many newly educated people continue to find employment in traditional sectors such as agriculture, services, construction and manufacturing. In addition, it may not always be the case that the skills required in the rapidly growing BPOs and call centres are best acquired through general education, but may be instead better learned through on-the-job, in-house training (ADB, 2007b).

Scenarios were developed to model the impact of a faster rise in labour force educational attainment in terms of skills mismatch. In an extreme scenario, the 'new highly educated' (NHE) people (i.e. the additional share of the labour force with secondary and tertiary education) are all absorbed into unemployment (scenario 1). In this case, the skills distribution of unemployed people is changed, but the skills mismatch among employed people is not affected (figure 26). Specifically, the unemployment rate of people with secondary and tertiary education rises, while that of people with less than secondary education declines. Scenario 1 implies that the economy's demand for higher skilled workers remains constant as the labour force's educational attainment rises.

In another extreme case (scenario 2), the NHE people are nearly all absorbed into employment, in which case, the skills distribution of unemployed people does not change much, but the skills distribution of employed people changes (figure 26). Specifically, there are more employed people with secondary and tertiary education. Although the mismatch shares for each skills level are unchanged, the numbers of workers that these shares represent are changed. This scenario implies that the rise in educational attainment is accompanied by a corresponding increase in demand (or employment opportunities) for higher skilled workers.

Figure 26 Higher labour force educational attainment scenarios (2016)



Source: PEPM 2012

Finally, a middle (more realistic) scenario 3 involves part of the NHE workers being absorbed into unemployment and another part into employment. As a result, the skills distribution of unemployed and employed people and the skills mismatch among the employed change. Specifically, the unemployment rate of people with secondary and tertiary education increases, but by less than in scenario 1, and the number of employed people with these skill levels also increases, but by less than in scenario 2. Scenario 3 implies that demand for high skilled workers is increasing, but at a slightly slower pace than the rise in educational attainment of the labour force.

2.2. Fiscal policy and labour market impacts – Austerity scenario

Final government consumption in the Philippines increased at an average annual rate of 3.9 per cent between 2001 and 2010 (table 19). Increasing tax revenues, particularly following the VAT system reform in 2005, enabled a rise in government spending during this period. In 2009 and 2010 however, tax relief measures were granted to certain sectors, which reversed some of the gains from earlier tax reforms (NEDA, 2011). Furthermore, final government consumption increased by nearly 11 per cent in 2009 due to stimulus spending in response to the global economic crisis, and by an additional 4 per cent in 2010 (recall section 1.3.1, table 1). Large budget deficits incurred due to the stimulus spending however have led to the need for fiscal consolidation, at a time when financing gaps remain in infrastructure and social services, resulting from earlier efforts to reduce government spending (NEDA, 2011).

Baseline PEPM projections, based on linear trends of growth in tax revenues and government expense, have final government consumption growth averaging 3.6 per cent between 2010 and 2013, and 4.9 per cent over the rest of the forecast period (2013-2016) (table 19).[43] Underlying the baseline projections is a 1.9 per cent average annual growth in tax revenues of the forecast period and a 1.7 per cent average annual rise in government expense. Consistently with these assumptions, the fiscal balance[44] would change from -4.8 per cent of GDP in 2010, to -3.8 per cent of GDP in 2016. However, in the PDP, the government has set a midterm target for reducing the fiscal deficit to -2 per cent of GDP by 2013, and keeping it constant thereafter to 2016.[45] To achieve this objective, the government would have to increase tax revenues, decrease spending, or a combination of both. Indeed, the government's strategy for the medium term is to increase the tax effort through tax policy and administration reforms as well as to limit government spending (NEDA, 2011).

[43] *Government expense* is cash payments for operating activities of the government in providing goods and services. It includes compensation of employees (such as wages and salaries), interest and subsidies, grants, social benefits, and other expenses such as rent and dividends. *Final government consumption expenditure* includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation (World Bank, 2012).

[44] The fiscal balance is calculated here as tax revenues minus government expense. Tax revenues account for over 90 per cent of government total revenues.

[45] NEDA (2011), Chapter 2, Table 2.5, (p.57).

Table 19 Fiscal, macroeconomic and labour market variables – Baseline results and austerity scenario (2001-2016)

					Baseline Projection		Austerity scenario		*Annual or average annual change (%)*						
										Baseline Projection			Austerity scenario		
	2001	2008	2009	2010	2013	2016	2013	2016	01-10	10-13	13-16	10-16	10-13	13-16	10-16
Real GDP (bil. 2000 PHP)	3'684.3	5'237.1	5'297.2	5'701.5	6'452.3	7'734.1	6'409.0	7'649.9	5.0	4.2	6.2	5.2	4.0	6.1	5.0
Final Government Consumption (bil. 2000 PHP)	402.5	494.4	548.3	570.2	634.6	733.3	608.7	687.8	3.9	3.6	4.9	4.3	2.2	4.2	3.2
Final Household Consumption (bil. 2000 PHP)	2'690.9	3'730.9	3'817.9	3'945.8	4'429.3	5'083.8	4'403.4	5'029.4	4.3	3.9	4.7	4.3	3.7	4.5	4.1
Real per capita GDP (thous. 2000 PHP)	47.4	58.0	57.6	60.8	65.1	74.1	64.7	73.3	2.8	2.3	4.4	3.3	2.1	4.3	3.2
Net ODA (bil. 2000 PHP)	24.6	0.2	9.8	7.9	1.9	1.4	1.9	1.4	-11.9	-37.6	-10.0	-25.1	-37.6	-10.0	-25.1
Tax revenue (bil. 2000 PHP)	464.1	711.7	647.9	668.7	710.3	749.6	775.9	806.6	4.1	2.0	1.8	1.9	5.1	1.3	3.2
Government expense (bil. 2000 PHP)		858.4	940.7	943.0	993.5	1'041.6	906.4	964.6		1.8	1.6	1.7	-1.3	2.1	0.4
Fiscal balance (bil. 2000 PHP)		-146.8	-292.8	-274.3	-283.2	-292.0	-130.5	-158.0		1.1	1.0	1.0	-21.9	6.6	-8.8
Fiscal balance (% GDP)		-2.8	-5.5	-4.8	-4.4	-3.8	-2.0	-2.1							
Inflation (%)	5.4	7.3	2.7	4.1	4.8	4.7	4.8	4.7							
Employment (mil.)	29.2	34.1	35.1	36.0	38.4	41.4	38.3	41.1	2.4	2.2	2.5	2.3	2.0	2.4	2.2
Unemployment (mil.)	2.2	2.7	2.8	2.9	3.2	3.1	3.3	3.4	3.0	3.9	-0.9	1.5	5.4	0.5	2.9
Aggregate Productivity (thous. PHP per worker)	126.4	153.6	151.1	158.2	167.9	186.9	167.4	186.2	2.5	2.0	3.6	2.8	1.9	3.6	2.7
Labor Force Participation Rate (%)	64.1	63.6	64.0	64.1	63.9	63.9	63.9	63.9							
Employment to population ratio (%)	59.6	58.9	59.2	59.3	59.0	59.4	58.8	59.0							
Unemployment Rate (%)	7.0	7.4	7.5	7.3	7.7	7.0	8.0	7.6							

Source: PEPM 2012

To analyse the potential impacts of fiscal consolidation, an 'austerity scenario' is presented in this section. Under the austerity scenario, the growth in tax revenues is higher (3.2 per cent average annual growth over the forecast period) and growth in government expense is lower (0.4 per cent annual growth over the forecast period, even negative between 2010 and 2013). As a result, the fiscal deficit is more than halved by 2013 (-130 bil. 2000 PHP instead of the baseline projection of -280 bil. 2000 PHP). Note that another PDP midterm target for monetary policy, which is keeping the inflation rate between 3 and 5 per cent between 2010 and 2013, is consistent with both the baseline and austerity scenarios in this case (table 19).

What would be the *macroeconomic impacts* of achieving the policy objective of reduced fiscal deficit? Lower government final consumption and higher taxes lead to slower GDP growth, directly, because government consumption is a component of GDP, and indirectly through its impact on private consumption (feedback effects). Indeed, under the austerity scenario, the average annual growth of government consumption over the forecast period is 1.2 percentage points lower, the average annual growth of final household consumption is 0.2 percentage point lower, and the average annual GDP growth is also 0.2 percentage point lower than under the baseline scenario (table 19).

What would be the *labour market impacts* of austerity measures? Lower economic growth results in slower employment growth and higher increases in unemployment (table 19). Indeed, under the austerity scenario, the unemployment rate would reach 7.6 per cent in 2016, 0.7 percentage point higher than the baseline scenario, and the employment-to-population rate would be 59 per cent, 0.4 percentage point lower than the baseline projection. Progress on achieving the other employment MDGs would be slower as well: lower labour productivity growth, slower decline in working poverty and in vulnerable employment (table 20).

Table 20 Austerity scenario and the MDGs

MDG Indicator		LP growth rate	EPR	WPR1	VER
	2005	2.5	59.4	19.4	44.8
	2010	4.7	59.3	16.6	41.7
Baseline projection	2015	3.6	59.2	15.2	40.7
Austerity scenario	2015	3.6	58.9	15.3	40.9
Total change	2005-2010	2.2	-0.1	-2.7	-3.1
Baseline Forecasted Change	2010-2015	-1.1	-0.1	-1.4	-0.9
Austerity Forecasted Change	2010-2016	-1.2	-0.5	-1.3	-0.8

Source: PEPM 2012

Under the austerity scenario, government spending on public administration and defence and social security would rise at a slower rate over the forecast period (2.8 per cent instead of 3.6 per cent average annual growth rate) (table 21). Similarly, government spending on education would rise at a rate of 2.9 per cent instead of 4.5 per cent, and spending on health and social work would increase by 5.9 per cent annually instead of 7.7 per cent. Because of the importance of these sectors, lower government spending is likely to have additional *social impacts* in the medium and long terms.

Table 21 Government consumption by sector (bil. PHP) – Baseline results and austerity scenario (2000-2016)

					Baseline Projection		Austerity scenario		*Annual or average annual change (%)*						
										Baseline Projection			Austerity scenario		
	2000	2008	2009	2010	2013	2016	2013	2016	00-10	10-13	13-16	10-16	10-13	13-16	10-16
Public Administration and Defense; Compulsory Social Security	280	342	363	381	419	471	407	450	3.1	3.2	4.0	3.6	2.2	3.4	2.8
Education	103	110	129	129	143	168	134	154	2.3	3.4	5.6	4.5	1.3	4.6	2.9
Human Health and Social Work Activities	27	42	56	60	73	94	68	84	8.3	6.6	8.9	7.7	4.2	7.6	5.9
Total	**409**	**494**	**548**	**570**	**635**	**733**	**609**	**688**	**3.4**	**3.6**	**4.9**	**4.3**	**2.2**	**4.2**	**3.2**

Source: PEPM 2012

Negative social impacts of budgetary cuts can of course be mitigated if these cuts are implemented in 'wasteful and inefficient' programs or non priority areas. Indeed, reducing these inefficient expenditures while increasing 'productive expenditures' in infrastructure, health and education is a key challenge that the Philippines' government must face in the medium term (NEDA, 2011). A framework and specific measures for expenditure policy reform are presented in the PDP 2011-2016.

3. Conclusions and further work

EPMs are important analytical tools to be used in strategic planning and policymaking, as they allow for a comprehensive analysis of the labour market in its broader economic context. This paper has illustrated a number of applications of EPMs, such as developing and measuring progress towards employment targets; modifying assumptions to allow for scenario modeling; and identifying sectors or subsectors that could be pivotal in the generation of decent work opportunities.

The results of the PEPM suggest that despite an annual GDP growth rate of 5.2 per cent over the forecast period (2010-2016), employment growth in the Philippines is projected to be only marginally faster than working-age population growth. As a result the EPR would only increase by 0.1 percentage point over the forecast period. The net employment growth projection of 5.4 million workers between 2010 and 2016, which corresponds to the baseline economic outlook, is slightly below the PDP 2011-2016 target of 6 million associated with a faster GDP growth outlook. The unemployment rate, which remains relatively high for a developing country, is projected to increase during the first half of the forecast period, and decline thereafter to 7.0 per cent by 2016.

Because a large number of workers in developing economies are engaged in low productivity, vulnerable employment, often in the informal sector, employment and unemployment rates and trends alone are not sufficient to adequately depict the labour market situation in these economies. EPMs can be extended to allow projecting additional indicators that reflect the quality of employment and the living standards of workers. PEPM results suggest a continuation of historical trends whereby vulnerable employment and working poverty rates continue to decline, but the absolute numbers of vulnerable workers and of working poor continue to increase over time. These trends imply that employment growth is largely driven by the growth in working-age population, and to a lesser extent, by the increased availability of decent work opportunities.

Between 2010 and 2015, the target date for the achievement of the MDGs, more progress is expected in terms of further declines in the working poverty and vulnerable employment rates, but this progress is likely to be slower than that of the previous period. The employment-to-population ratio is forecasted to decrease by another 0.1 percentage point between 2010 and 2015, while labour productivity is forecasted to be 1.1 percentage points lower in 2015 than in 2010. PEPM results suggest that concerted policy action is needed to ensure that the country is on track for achieving the MDG employment targets by 2015.

EPMs are also particularly suited to inform industrial policies because they capture inter-industry linkages and the changing structure of employment. PEPM results suggest that employment growth in agriculture is projected to be slower than the historical average, and its share in employment is projected to continue declining over the forecast period, although at a slower pace than over the historical period. Growth in industry employment is also expected to be slow over the forecast period, which may have significant implications, as the sector often comprises a higher share of decent work opportunities and higher productivity jobs. Industry employment growth is projected to be slowest in manufacturing, due to the poor performance of certain manufacturing sub-sectors.

The services sector, which is the largest sector in the Philippines, both in terms of value added and employment will continue to absorb the greatest share of the country's growing labour force. The services sub-sectors with high projected employment growth rates are sub-sectors with relatively high labour productivity and a higher prevalence of decent work opportunities. In particular, among the top sectors with high employment growth rates are services subsectors associated with BPOs and IT services, such as professional, scientific and technical services; administrative and support services

activities; and information and communication. However, in terms of number of people employed, the wholesale and retail trade sector and the agriculture sector are the two sectors that will continue to absorb the largest share of the Philippines' growing workforce. These two subsectors have lower labour productivity and higher shares of vulnerable employment.

EPMs can also be extended to analyse the important issue of skills mismatch. Skills mismatch does not only lead to high unemployment however, but may also exist in the form of workers employed in occupations that underutilise their skills set (overqualified workers) or in occupations normally requiring skills that they do not possess (under-qualified workers).

Between 2001 and 2010, skills mismatch decreased as a share of employment in the Philippines. As the labour force's educational attainment increased, a decline in the share of under-qualified workers in total employment has offset the increase in the share of overqualified workers. However, the decrease in actual mismatch was lower than the decrease in potential mismatch, which suggests that some barriers may be preventing a more efficient allocation of labour whereby workers are employed in occupations that correspond to their skills levels.

Over the forecast period, skills mismatch is projected to continue declining, but at a slower rate. The share of overqualified workers is projected to continue increasing, and that of under-qualified workers to continue decreasing. Disaggregating skills mismatch by education level provides interesting insight as well. Indeed, the decrease in mismatch is mainly driven by the less than secondary education group. As the share of workers with secondary and tertiary education grows, these workers are increasingly likely (for those who have completed secondary school) or just as likely (for those with tertiary education) to be employed in occupations that do not correspond to their skills levels. Furthermore, the labour force with completed secondary school is projected to have a higher unemployment rate in 2016. However, the unemployment rate of for the labour force with tertiary education is projected to decrease by 2016. In general, these findings are consistent with conclusions of previous studies, specifically, that the supply of highly educated workers is growing faster than the number of job opportunities in the sectors that traditionally employ them.

An important application of EPMs for policymaking – the changing of the model's assumptions to produce alternative scenarios – was presented by simulating the impact of a change in fiscal policy, specifically, of a fiscal consolidation or 'austerity scenario'. PEPM results illustrated potential macroeconomic, social and labour market impacts of achieving the government's objective of reducing the fiscal deficit in the medium term. In particular, lower government final consumption and higher taxes lead to slower GDP growth, directly, because government consumption is a component of GDP, and indirectly through its impact on private consumption (feedback effects); spending on public administration, defence and social security, education and health would increase at a slower rate than in the baseline scenario. The labour market impacts would be slower employment growth, labour productivity growth and decline in the working poverty rate and in the vulnerable employment rate, and higher unemployment. Of course, negative social and labour market impacts of budgetary cuts may be mitigated if these cuts are implemented in inefficient programs while maintain or increasing 'productive expenditures' in infrastructure, health and education. This is a key challenge that the Philippines' government must face in the coming years.

Although the PEPM in its current version is a useful analytical tool, a number of extensions and improvements can still be made to it. For instance, employment data by sector can (and should) be disaggregated by sex, to enable developing and measuring progress towards gender employment targets or analysing the gender impact of exogenous shocks or policy shifts. Employment data can also be disaggregated by region to allow

analysing labour market outcomes by region or specifically for rural and urban areas. For instance, the growth in BPOs and IT-related industries concentrated around the national capital region generates employment in urban areas, while growth in agriculture creates work for rural populations. Furthermore, rural populations may be disproportionately affected by exogenous shocks related to natural disasters. Such disaggregation would enable linking rural urban migration patterns to changes in countries' economic and employment structures. Additional relevant variables can also be brought into the framework. For instance, income inequality can be included by modeling the income distribution and linking its parameters to economic variables (Meade, 2012).

Other changes and improvements can be made to the PEPM from a technical perspective, such as making the labour force forecast endogenous (responsive to changes in economic outlook, without needing to modify exogenous assumptions), adding a price and income determination block, and better capturing structural change by allowing technical and industry-occupation coefficients to change over the forecast period. Finally, linkages between the education and skills distribution of the workforce, skills mismatch and economic growth can be brought in the model. Such further developments of the model are currently being discussed by the ILO and Inforum.

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Annex 1 PEPM Variables, Data Sources and Baseline Assumptions

Variable	Source (historical data)	PEPM 2012
GDP	NSCB, National Accounts	Endogenous Determined through GDP loop
Private consumption	NSCB, National Accounts	Endogenous Determined through new consumption equation
Government consumption	NSCB, National Accounts	Endogenous Determined through government spending equation
Gross capital formation	NSCB, National Accounts	Exogenous Growth rate based on EIU forecast
Exports	NSCB, National Accounts	Exogenous Growth rate based on EIU forecast
Imports	NSCB, National Accounts	Endogenous Aggregated from industry level imports determined during Seidel process
GDP components deflators	NSCB, National Accounts	Exogenous Growth rate based on EIU forecast
Remittances	Philippines Central Bank	Exogenous Growth rate forecasted by Central Bank for 2011, decreasing slowly to historical (2003-2010) average rate by 2020
Official development assistance (ODA)	World Bank, WDI database	Exogenous Assumption: linear trend over forecast period
Tax revenues	World Bank, WDI database	Exogenous Linear trend, adjusted for additional information/ judgement
Government spending	World Bank, WDI database	Exogenous Linear trend, adjusted for additional information/ judgement
Labour productivity (LP) by sector	Derived from LFS (NSO) and IO Table (NSCB, National Accounts)	Endogenous Determined through regression of LP on change in output and lagged LP, for each sector
Final demands (except imports) by sector	NSCB, National Accounts, IO Table	Endogenous Determined through regressions on selected variables including lagged industry final demands and output, macro-level final demands
Imports by sector	NSCB, National Accounts, IO Table	Endogenous Determined through the Seidel Process
Import share of domestic demand	Derived from IO table (NSCB, National Accounts)	Exogenous Linear interpolation over the forecast period
Input-output (technical) coefficients	NSCB, National Accounts, IO Table	Exogenous Assumption: 2010 coefficients kept constant over the forecast period
Industry-Occupation coefficients	NSO, LFS datasets	Exogenous Assumption: 2010 coefficients kept constant over the forecast period
Vulnerable employment share by sector or occupation	NSO, LFS datasets	Exogenous Follows linear trend for each sector over the forecast period
Working poverty rate by sector	NSO, merged FIES-LFS datasets	Exogenous Follows linear trend for each sector over the forecast period
Labour force	NSO, LFS datasets	Exogenous Based on EAPEP forecast

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