



OECD Economic Surveys UNITED STATES

JUNE 2014



OECD Economic Surveys: United States 2014

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

Please cite this publication as:

OECD (2014), *OECD Economic Surveys: United States 2014*, OECD Publishing.
http://dx.doi.org/10.1787/eco_surveys-usa-2014-en

ISBN 978-92-64-20698-4 (print)
ISBN 978-92-64-20699-1 (PDF)

Series: OECD Economic Surveys
ISSN 0376-6438 (print)
ISSN 1609-7513 (online)

OECD Economic Surveys: United States
ISSN 1995-3046 (print)
ISSN 1999-0103 (online)

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Photo credits: Cover © mbell/Flickr/Getty Images.

Corrigenda to OECD publications may be found on line at: www.oecd.org/about/publishing/corrigenda.htm.

© OECD 2014

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgement of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to rights@oecd.org. Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at info@copyright.com or the Centre français d'exploitation du droit de copie (CFC) at contact@cfcopies.com.

Table of contents

Basic statistics of the United States, 2012	7
Executive summary	9
Main findings	10
Key recommendations	11
Assessment and recommendations	13
The economy is recovering	14
Structural reforms, including comprehensive tax reform, can boost long-term growth	20
Financial reform should be rolled out fully	22
Labour market reform can boost employment	24
<i>Recommendations for macroeconomic management</i>	27
Americans are generally happy, although working families face rising pressures	27
<i>Recommendations to help working families address rising pressures</i>	35
Making the best of new energy resources	36
<i>Recommendations for managing new energy resources</i>	43
Bibliography	44
Annex. Follow-up to previous OECD policy recommendations	47
Thematic chapters	
Chapter 1. Improving well-being	55
What explains rising work-life pressures?	59
Work-life conflicts have negative health consequences	64
Job quality matters for wellbeing	67
The working poor face different well-being challenges	68
Family paid leave and flexible workplaces	71
Early education and childcare	74
<i>Recommendations to improve the well-being of Americans</i>	77
Bibliography	78
Chapter 2. Making the best of new energy resources	83
The United States is well endowed with natural resources	84
Capturing the economic benefits	87
Local impacts	95
Links to climate change	98
<i>Recommendations</i>	105
Bibliography	106
Glossary	109

Boxes

1. Base erosion and profit shifting (BEPS)	21
2. GSE Reform	23
3. Taxation of non-renewable natural resources	42
1.1. Beyond GDP	57
1.2. Work-life balance: How bad is it?	59
1.3. What matters for Americans?	65
2.1. Taxation of non-renewable natural resources	91
2.2. Natural resources and economic sustainability	93
2.3. Greater weather variability	100
2.4. The Regional Greenhouse Gas Initiative	101

Tables

1. Macroeconomic indicators and projections	17
2. Tax revenue from oil and gas	43
2.1. Estimates of oil and gas wealth	86
2.2. Tax revenue from oil and gas	92

Figures

1. The economic recovery in historical perspective	15
2. Balance sheets are relatively healthy	16
3. The budget deficit has fallen and fiscal projections have improved	18
4. Inflation is running below the FOMC objective	19
5. Stock market indexes have reached nominal highs and P/E ratios are above historical averages	19
6. Output after the crisis	20
7. Labour market trends are mixed	25
8. Disability benefit applications and awards have increased	26
9. Well-being is high, but not for all	28
10. Income growth has varied considerably across groups	29
11. Cash incomes of bottom 10% have stagnated	30
12. American families are facing rising time pressures	30
13. The US minimum wage has fallen behind	31
14. The US lags behind in early education spending	32
15. Job protected maternity and parental leave in OECD countries, 2011	33
16. Low-wage workers have fewer benefits in the private sector (2013)	34
17. Natural gas has increased its importance in energy consumption, 1910-2012	36
18. The energy sector is expanding	37
19. US natural gas prices have diverged from oil prices and international gas prices	38
20. Some progress in reducing greenhouse gas emissions	40
1.1. Well-being is high, but not for all	58
1.2. Working time has increased in the manufacturing sector	60
1.3. Convergence of men and women labour-market participation	61
1.4. American families are facing rising time pressures	61
1.5. Working time challenges vary across income groups	62
1.6. Public spending supporting families is low in the United States	64
1.7. Low-wage workers have fewer benefits in the private sector (2013)	67

1.8. Which are the characteristics of good jobs?	68
1.9. The US minimum wage has fallen behind	70
1.10. Raising the federal minimum wage would have ripple effects	71
1.11. The American poor are a heterogeneous group	72
1.12. The US lags behind in early education spending	74
1.13. Early childhood education is not well developed	75
1.14. Fewer children are enrolled in early childhood and primary education	76
2.1. Production and reserves of oil and natural gas are rising	85
2.2. Shale gas reserves and production are concentrated in a few states	86
2.3. The shale boom is boosting employment and net exports	87
2.4. Growth in the oil and gas mining sectors is fast in some states	88
2.5. Oil and gas prices have diverged	89
2.6. Adjusted national savings (2008)	94
2.7. Average annual productivity growth with and without natural capital	94
2.8. Some progress in reducing greenhouse gas emissions	99
2.9. Variation in electricity demand is growing	100
2.10. Coal production has fallen while exports have risen	103

This Survey is published on the responsibility of the Economic and Development Review Committee (EDRC) of the OECD, which is charged with the examination of the economic situation of member countries.

The economic situation and policies of the United States were reviewed by the Committee on 21 May 2014. The draft report was then revised in the light of the discussions and given final approval as the agreed report of the whole Committee on 2 June 2014.

The Secretariat's draft report was prepared for the Committee by Douglas Sutherland and Aida Caldera Sánchez, with statistical research from Valery Dugain, under the supervision of Patrick Lenain.

The previous Survey of the United States was issued in June 2012.

Information about the latest as well as previous Surveys and more information about how Surveys are prepared is available at www.oecd.org/eco/surveys.

Follow OECD Publications on:



http://twitter.com/OECD_Pubs



<http://www.facebook.com/OECDPublications>



<http://www.linkedin.com/groups/OECD-Publications-4645871>



<http://www.youtube.com/oecdlibrary>



<http://www.oecd.org/oecdirect/>

This book has...

StatLinks 

A service that delivers Excel® files from the printed page!

Look for the StatLinks  at the bottom of the tables or graphs in this book. To download the matching Excel® spreadsheet, just type the link into your Internet browser, starting with the <http://dx.doi.org> prefix, or click on the link from the e-book edition.

Basic statistics of the United States, 2012

(Numbers in parentheses refer to the OECD average)^a

LAND, PEOPLE AND ELECTORAL CYCLE				
Population (million)	313.9		Population density per km ²	31.9 (34.3)
Under 15 (%)	19.5 (18.4)		Life expectancy (years, 2011)	78.7 (80.0)
Over 65 (%)	13.7 (15.3)		Men	76.3 (77.3)
Foreign-born (% , 2011)	13.0		Women	81.1 (82.8)
Latest 5-year average growth (%)	0.8 (0.5)		Latest general election	Sept. 2012
ECONOMY				
Gross domestic product (GDP)			Value added shares (%)	
In current prices (billion USD, 2013)	16 799.7		Primary sector	1.2 (2.5)
Latest 5-year average real growth (% , 2013)	1.2 (0.8)		Industry including construction	20.2 (27.4)
Per capita, PPP (thousand USD)	51.7 (37.3)		Services	78.6 (70.1)
			Median equivalised household income, PPP (000 USD, 2010)	29.1 (20.4)
GENERAL GOVERNMENT				
Per cent of GDP				
Expenditure (2013)	39.0 (42.7)		Gross financial debt (2013)	104.3 (107.6)
Revenue (2013)	32.6 (36.8)		Net financial debt (2013)	81.2 (67.9)
EXTERNAL ACCOUNTS				
Exchange rate (EUR per USD, 2013)	0.8		Main exports (% of total merchandise exports, 2013)	
PPP exchange rate (USA = 1)	1.0		Machinery and transport equipment	33.8
In per cent of GDP			Chemicals and related products, n.e.s.	13.4
Exports of goods and services (2013)	13.5 (53.5)		Commodities and transactions, n.e.s.	11.6
Imports of goods and services (2013)	16.4 (49.4)		Main imports (% of total merchandise imports, 2013)	
Current account balance (2013)	-2.3 (0.0)		Machinery and transport equipment	38.8
Net international investment position	-23.8		Mineral fuels, lubricants and related materials	16.7
			Miscellaneous manufactured articles	14.9
LABOUR MARKET, SKILLS AND INNOVATION				
Employment rate (%) for 15-64 year-olds (2013)	67.4 (65.2)		Unemployment rate, Labour Force Survey	
Men (2013)	72.6 (73.1)		(age 15 and over) (%), 2013	7.4 (7.9)
Women (2013)	62.3 (57.4)		Youth (age 15-24) (%), 2013	15.5 (16)
Participation rate (%) for 15-64 year-olds (2013)	72.8 (70.9)		Long-term unemployed (1 year and over)	2.4 (2.7)
Average hours worked per year	1 790 (1 765)		Tertiary educational attainment 25-64 year-olds (% , 2011)	42.4 (31.5)
			Gross domestic expenditure on R&D (% of GDP)	2.8 (2.4)
ENVIRONMENT				
Total primary energy supply per capita (toe)	6.8 (4.2)		CO ₂ emissions from fuel combustion per capita (tonnes, 2011)	17.0 (10.0)
Renewables (%)	6.3 (8.5)		Water abstractions per capita (1 000 m ³ , 2010)	..
Fine particulate matter concentration (urban, PM ₁₀ , µg/m ³ , 2010)	18.6 (28.7)		Municipal waste per capita (tonnes)	(0.5)
SOCIETY				
Income inequality (Gini coefficient, 2010)	0.380 (0.304)		Education outcomes (PISA score, 2012)	
Relative poverty rate (% , 2010)	17.4 (10.9)		Reading	498 (496)
Public and private spending (% of GDP)			Mathematics	481 (494)
Health care (2011)	17.7 (9.5)		Science	497 (501)
Pensions (2009)	6.9 (8.7)		Share of women in parliament (% , December 2013)	18.2 (26.2)
Education (primary, secondary, post sec. non tertiary, 2010)	4.0 (4.0)		Net official development assistance (% of GNI)	0.2 (0.4)

Better life index: www.oecdbetterlifeindex.org

a) Where the OECD aggregate is not provided in the source database, a simple OECD average of latest available data is calculated where data exist for at least 29 member countries.

Source: Calculations based on data extracted from the databases of the following organisations: OECD, International Energy Agency, World Bank, International Monetary Fund and Inter-Parliamentary Union.

Executive summary

- *Main findings*
- *Key recommendations*

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Main findings

A welcome recovery, which could be boosted by tax and other key reforms

The US economy is recovering from the Great Recession and near-term prospects are favourable. The sector of manufacturing durables is enjoying a particularly strong revival thanks to more competitive labour costs and low energy prices. The recovery is more sluggish than after past recessions because the damage of the financial crisis has not been fully repaired, government spending has exerted an unusual drag and, finally, the long-expected retirement of baby-boomers has depressed the labour supply. Hence, removing obstacles to growth comes with a certain degree of urgency. For this, tax reform has a key role to play: business investment is discouraged by high marginal tax rates while numerous tax expenditures distort resource allocation. Aggressive tax planning by multinational firms also imposes a higher tax burden on everybody else; and individual taxpayers face costly compliance obligations. Other key reforms could also improve long-term growth prospects, notably policies to raise labour-force participation, improve immigration laws, help parents with young children and ease access to quality education for lower-income groups.

Well-being is distributed unequally

Americans enjoy, on average, high levels of income and well-being, thanks to the country's dynamic economy and thriving business sector. Nonetheless, there is evidence to suggest that the benefits from these gains have not been sufficiently broad based. Self-reported happiness increases with income, an issue particularly resonant in a country with among the highest levels of income inequality in the OECD and a pattern of income distribution that appears to be moving toward even more concentration at the very top. Low-income families face particularly tough conditions in terms of jobs, incomes, education and healthcare. These trends cannot be easily reversed but a number of options could help to improve job quality and work-life balances, especially for working families with young children. If successfully adopted, they would go a long way toward improving well-being.

Making the best of new energy resources

An "energy renaissance" is underway, thanks to abundant stocks of shale oil and gas being made accessible by new technologies, such as hydraulic fracturing. The United States is now the largest producer of natural gas in the world. The abundance of resources has caused welcome economic booms in some states, where governments should seize this opportunity to invest in skills and infrastructure to benefit future generations. Policies and investments are needed to mitigate the environmental risks, such as water pollution. The production of renewable energy has also expanded markedly, notably wind and solar power, which have both doubled in capacity since 2008 despite very low natural gas prices.

Key recommendations

Strengthening economic growth

Comprehensive tax reform:

- Cut the marginal corporate income statutory tax rate and broaden its base, notably by phasing out tax allowances.
- Act towards rapid international agreement and take measures to prevent base erosion and profit shifting (BEPS).
- Make the personal tax system more redistributive by restricting regressive income tax expenditures.

Macroeconomic policy and financial stability:

- Fiscal policy needs to remain cautious and prepared to take actions to ensure longer-term sustainability.
- Gradually reduce and ultimately remove monetary accommodation as the economy approaches full employment and inflation returns to the Fed's 2% target.
- Continue to roll out macro-prudential policy tools, including those associated with the Dodd-Frank Act and those addressing vulnerabilities in wholesale funding, repo market and money-market mutual funds.
- Reform the housing finance system to ensure access to mortgage credit of creditworthy homebuyers while providing better guarantees of financial stability and avoiding again exposing taxpayers to costly bailouts.

Improving well-being

Job quality:

- Raise labour earnings at the low end by expanding the EITC, which would be more effective if supported by a higher minimum wage.
- Strengthen the portability and recognition of training by involving employers in programme design.
- Provide comprehensive work support to get disability recipients back to work.

Work-life balance:

- Provide support to parents with young children by expanding access to paid family leave nationally.
- Help states develop right-to-ask policies to support flexible working arrangements.
- Increase access of low and moderate-income families to quality preschool and childcare.
- Work with employers in preventing the negative effects of job strain on mental health, prolonged sick leaves, job loss and disability-benefit claims.

Making the best of new energy resources

Hydraulic fracturing:

- Study the environmental impacts of hydraulic fracturing and develop regulations to address any negative impacts including, if necessary, legislative action to harmonise regulation across states and strengthen *ex ante* environmental impact assessments for drilling projects.
- Invest in skills and infrastructure using receipts from profit taxes levied on oil and gas production.

Climate change:

- Further lower emissions with efficient policy tools, as part of the climate-change strategy, notably by putting a price on greenhouse gas emissions, though well-designed regulation and investment in renewables also have a role to play.
- Promote innovation in energy saving and low carbon technology.

Assessment and recommendations

- *The economy is recovering*
- *Structural reforms, including comprehensive tax reform, can boost long-term growth*
- *Financial reform should be rolled out fully*
- *Labour market reform can boost employment*
- *Americans are generally happy, although working families face rising pressures*
- *Making the best of new energy resources*

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Six years after the onset of the financial crisis, the US economic recovery is regaining momentum. Real GDP is about 6% above its pre-crisis level, the housing sector is beginning to recover, banks have returned to health, corporate profitability is high and equity prices have reached new peaks. The energy boom led by hydraulic fracturing brings a welcome impulse to growth. Many Americans have benefited from the recovery: job growth has been steady, unemployment has fallen and house prices are again rising – all helping to restore higher levels of consumer confidence. Yet, this is not a “business-as-usual” recovery. The economic rebound has been weaker than after past recessions (Figure 1), not only because of the lingering effects of the financial turmoil but also due to unusually large cut-backs in public spending, including government employment, and the long-expected retirement of baby boomers.

While the recovery is welcome, many families are being put under financial pressure by stagnant real incomes, underwater mortgages and high costs of education and healthcare. Many workers feel that their jobs interfere excessively with their family lives, making it challenging to achieve a satisfactory work-family balance. Environmental challenges also remain acute, although investments in renewable energy supplies have improved markedly.

Progress has been made in addressing some of these challenges. Congress and the Administration have extended expiring tax reliefs for the middle class and sought to avoid draconian cuts in discretionary spending. The Affordable Care Act has allowed millions of previously uninsured persons to obtain health coverage.

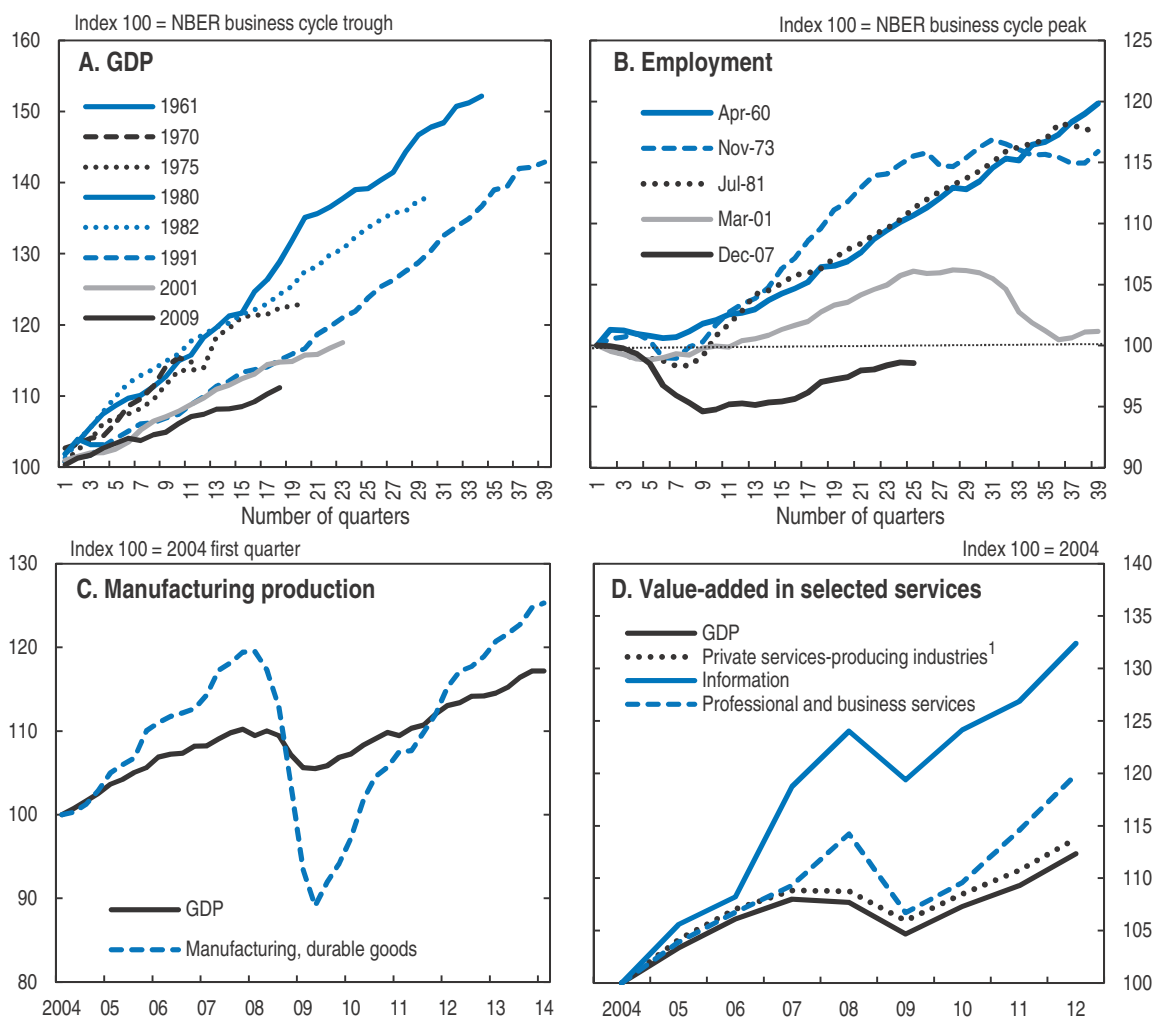
This report first addresses remaining macroeconomic and financial challenges, then reviews the pressures on working families, and finally discusses the consequences of the boom in hydraulic fracturing.

The economy is recovering

Economic growth is expected to gain speed through 2014 and 2015. Steady labour-market gains will provide support to private consumption. Combined with low mortgage rates and demand from household formation, this should boost house prices and construction. Corporate balance sheets look healthy (Figure 2) and cash assets are plentiful, which will facilitate a rebound in business investment once aggregate demand accelerates. The fiscal stance, which exerted a drag on the recovery, has become significantly less restrictive. All told, economic activity is projected to increase by about 2½ per cent (year-on-year) in 2014 and 3½ per cent in 2015 (Table 1).

Activity is picking up in several sectors. Technological breakthroughs in hydraulic fracturing have boosted the extraction of energy resources, driving down natural gas prices and enhancing prosperity in energy-producing states. The production of manufacturing durable goods is enjoying a strong revival, thanks to lower unit labour costs, real effective exchange-rate depreciation and cheap energy (Celasun et al., 2014). The service sector is

Figure 1. The economic recovery in historical perspective



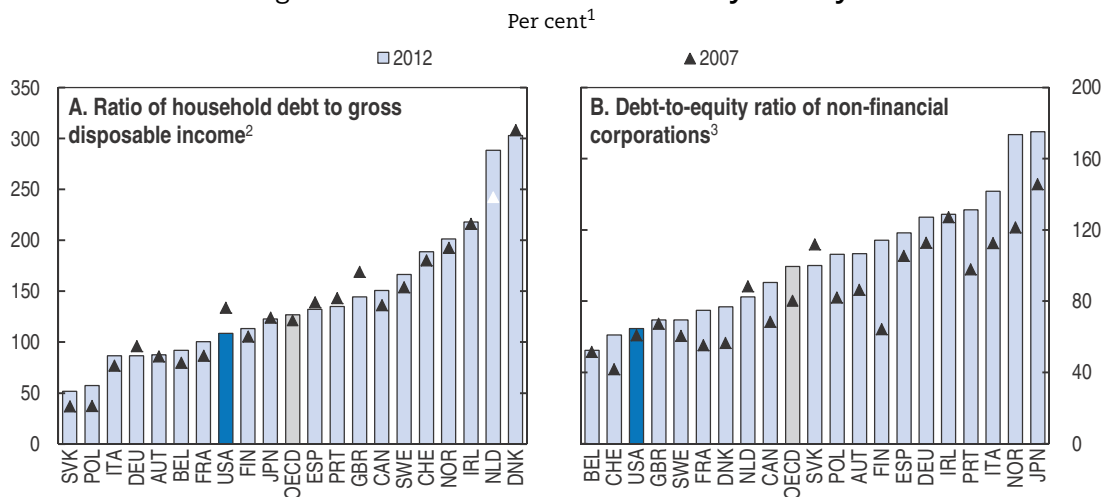
1. Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, real estate, rental, and leasing; professional and business services; educational services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.

Source: OECD Economic Outlook Database, Bureau of Economic Analysis and Datastream.

StatLink  <http://dx.doi.org/10.1787/888933080941>

also growing, particularly the information, communication and technology sectors. Overall, the rebound has been broadly balanced, making it more resilient than if it was concentrated in only a few industries.

The fiscal situation has improved markedly (Figure 3, Panel A), as the federal budget deficit has fallen to just over 4% of GDP for fiscal year 2013. The 2011 Budget Control Act forced a fast pace of consolidation and the expiration of tax reliefs contributed to significant budgetary savings. The 2013 Bipartisan Budget Act provided greater stability for fiscal policy than in the recent past and, with the falling deficit, the pace of fiscal consolidation is now appropriately set to slow. The Congressional Budget Office (CBO) estimates that the federal deficit will fall by another 1.3 percentage points of GDP over fiscal year 2014 to 2.8% of GDP (CBO, 2014a).

Figure 2. **Balance sheets are relatively healthy**

1. Debt is calculated as the sum of the following liability categories, whenever available/applicable: currency and deposits, securities other than shares, except financial derivatives, loans, insurance technical reserves and other accounts payable. Non-consolidated data from financial balance sheets.
 2. Debt of households including non-profit institutions serving households. The OECD aggregate covers 29 countries. 2011 instead of 2012 for Denmark, Japan and Switzerland.
 3. Debt as a percentage of shares and other equity. The OECD aggregate covers 34 countries. 2011 instead of 2012 for Japan and Switzerland.
- Source: OECD National Accounts Statistics (database).

StatLink  <http://dx.doi.org/10.1787/888933080960>

Medium and long-term fiscal projections have improved considerably, reflecting the fast pace of deficit reduction in 2012-13 as well as the significant slowdown of healthcare costs since 2010, which if sustained, could sharply attenuate long-term increases in Medicare spending. Persistently low long-term interest rates have also played a role. As a result, federal debt projections have been revised down and CBO (2014a) now expects the debt-GDP ratio to remain flat for the next ten years or decline moderately if the Administration's budget were adopted (Figure 3, Panel B). However, total public debt remains high by OECD standards (Figure 3, Panel C) and entitlement spending over the longer term is difficult to predict, notably given the effects of rising longevity and retirement decisions. Mainly because of the ageing population, rising health costs, expansion of federal subsidies for health insurance and growing interest payments on federal debt, CBO (2014b) projects that, if current law does not change, deficits will rise from 2.6% of GDP in 2015 to about 4% of GDP in 2024. To lock in recent improvements in the underlying budgetary position, fiscal policy needs to remain cautious and prepared to take actions as necessary to ensure longer-term sustainability. Other policies discussed in this report, such as tax reform and immigration reform, as well as entitlement reform, would also help improve the medium and long-term outlook.

To counter the crisis, the Federal Reserve has maintained a very accommodative policy stance by holding its policy rates essentially at zero, engaging in extensive "quantitative easing" (that is, by purchasing large amounts of Treasury bonds and mortgage-related securities), and providing forward guidance about the future path of the policy rate, thus supporting aggregate demand. Owing to the depth of the downturn following the 2008 crisis, both headline and core inflation remain below the Federal Reserve's objective of 2% over the medium term (Figure 4, Panel A) and wage growth remains weaker than before the crisis (Figure 4, Panel B). With the economic recovery gaining momentum, the Federal

Table 1. **Macroeconomic indicators and projections**

Annual percentage change, constant prices

	2011	2012	2013	2014	2015
GDP	1.8	2.8	1.9	2.5	3.5
Private consumption	2.5	2.2	2.0	2.9	3.2
Government consumption	-2.7	-0.2	-2.0	-0.5	0.0
Gross fixed capital formation	3.4	5.5	2.9	3.5	9.2
Housing	0.5	12.9	12.2	4.9	15.8
Business	7.6	7.3	2.7	5.3	10.1
Government	-5.3	-4.0	-3.2	-3.4	-0.2
Final domestic demand	1.8	2.4	1.6	2.6	3.9
Stockbuilding ¹	-0.2	0.2	0.2	0.1	0.0
Total domestic demand	1.7	2.6	1.7	2.8	3.9
Exports of goods and services	7.1	3.5	2.7	2.7	5.3
Imports of goods and services	4.9	2.2	1.4	3.1	7.2
Net exports ¹	0.1	0.1	0.1	-0.2	-0.5
Other indicators (growth rates, unless specified)					
Potential GDP	1.9	1.9	2.0	2.1	2.3
Output gap ²	-4.2	-3.4	-3.5	-3.1	-2.0
Employment	0.6	1.8	1.0	1.6	1.6
Unemployment rate (% of labour force)	8.9	8.1	7.4	6.5	6.0
Consumer price index	3.1	2.1	1.5	1.5	1.7
Core consumer prices	1.4	1.8	1.2	1.3	1.6
Household saving ratio, net ³	5.7	5.6	4.5	4.5	4.1
Current account balance ⁴	-2.9	-2.7	-2.3	-2.5	-2.9
General government financial balance ⁴	-10.7	-9.3	-6.4	-5.7	-4.5
Underlying government primary balance ²	-5.7	-4.8	-3.0	-2.4	-1.7
General government gross debt ^{4, 5}	98.8	102.1	104.3	106.2	106.5
General government net debt ^{4, 5}	76.1	80.0	81.2	83.8	84.1
Three-month money market rate, average, in %	0.4	0.4	0.3	0.3	0.9
Ten-year government bond yield, average, in %	2.8	1.8	2.4	3.0	3.6
<i>Memorandum items:</i>					
Federal budget surplus/deficit ⁴	-8.0	-6.5	-3.3
Federal debt held by the public ⁴	65.8	70.1	72.1

1. Contribution to changes in real GDP.

2. As a percentage of potential GDP.

3. As a percentage of household disposable income.

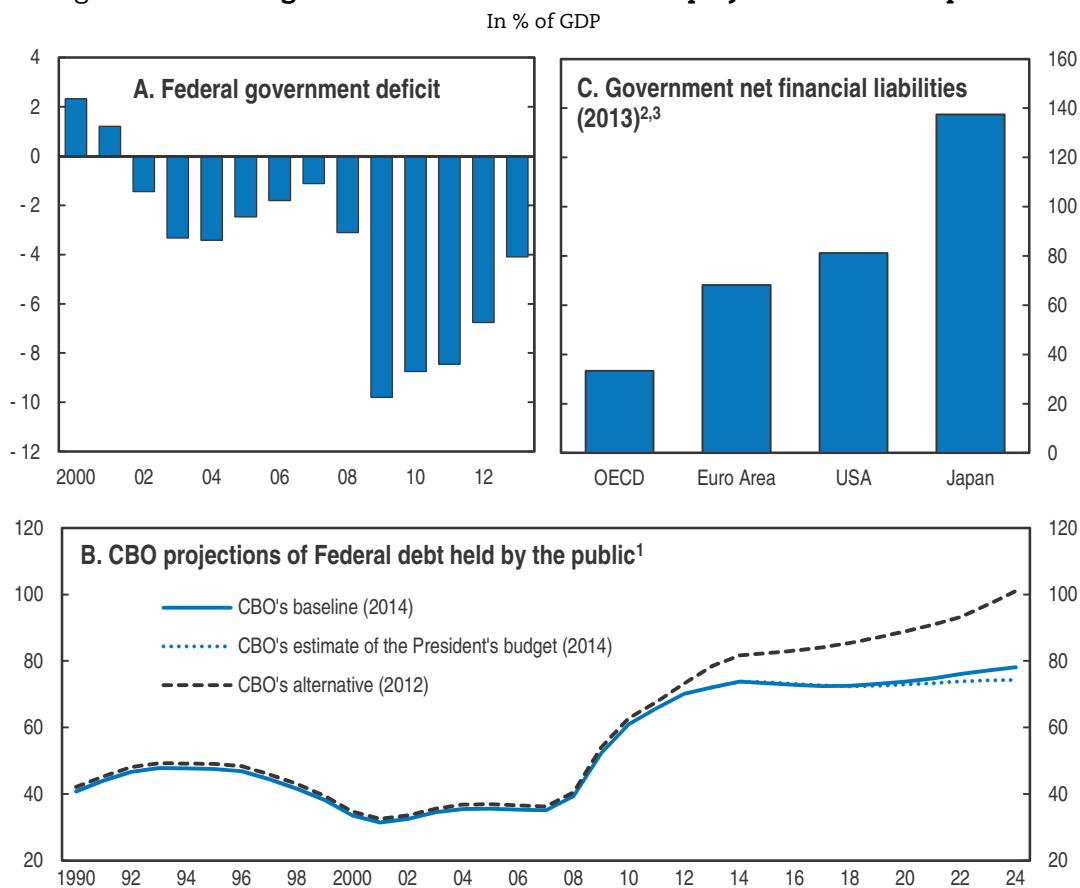
4. As a percentage of GDP.

5. General government shows the consolidated (i.e. with intra-government amounts netted out) accounts for all levels of government (central plus state/local). This measure is not the same as federal debt held by the public, which is typically reported in US budget analysis.

Source: OECD Economic Outlook 95 Database and the Congressional Budget Office.


Reserve decided to cut back gradually the amounts of its asset purchases. The gradual reduction in purchases will, at the present pace, be completed by the end of 2014. A gradual exit from unconventional monetary policy and increases in interest rates should begin as the economy approaches full employment and inflation returns to the Fed 2% target. While there is considerable uncertainty as to when this will be achieved, the first increase in interest rates is assumed by the OECD to take place in mid-2015.

With asset prices being one of the transmission channels of unconventional monetary policy, the Federal Reserve's liquidity injections have affected financial markets. Together with robust corporate earnings, this has boosted equity returns, with stock market indexes reaching new highs (Figure 5, Panel A). Price-earnings ratios are now well above the

Figure 3. **The budget deficit has fallen and fiscal projections have improved**

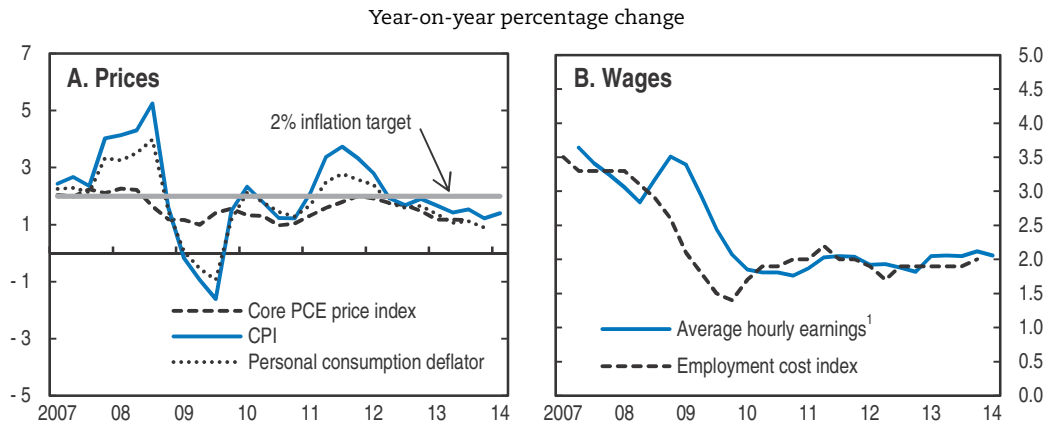
1. The CBO baseline projections are based on current law. The 2012 CBO alternative projection assumes that the middle class tax cuts would be extended and the automatic spending cuts required by the Budget Control Act of 2011 do not take effect; Congress approved these measures in 2013. The Bureau of Economic Analysis introduced a comprehensive revision of GDP in 2013, which revised up the level of GDP and thereby reduced the debt-to-GDP ratio (by between 2-3 percentage points in 2012). Information on the impact of the revision on budget aggregates is available at www.cbo.gov/publication/44508.
2. General government shows the consolidated (i.e. with intra-government amounts netted out) accounts for all levels of government (central plus state/local) based on OECD national accounts. This measure differs from the federal debt held by the public, which was 72% of GDP for the 2013 calendar year.
3. OECD average excluding Turkey, Chile and Mexico.

Source: OECD Economic Outlook Database and the Congressional Budget Office.

StatLink  <http://dx.doi.org/10.1787/888933080979>

averages in cyclically-adjusted terms since 1880, though they are still in the average range observed since the early 1990s (Figure 5, Panel B). In debt markets, high-yield bond issuance has increased rapidly and yields have come down, while house prices have risen substantially, though in real terms they are still below their pre-crisis peaks and mortgage debt has not risen. These developments were partially expected, but continued monitoring is necessary to spot the possible emergence of another bubble-bust cycle. These financial stability concerns argue for exiting monetary policy accommodation gradually, together with introducing macro-prudential tools, as discussed below.

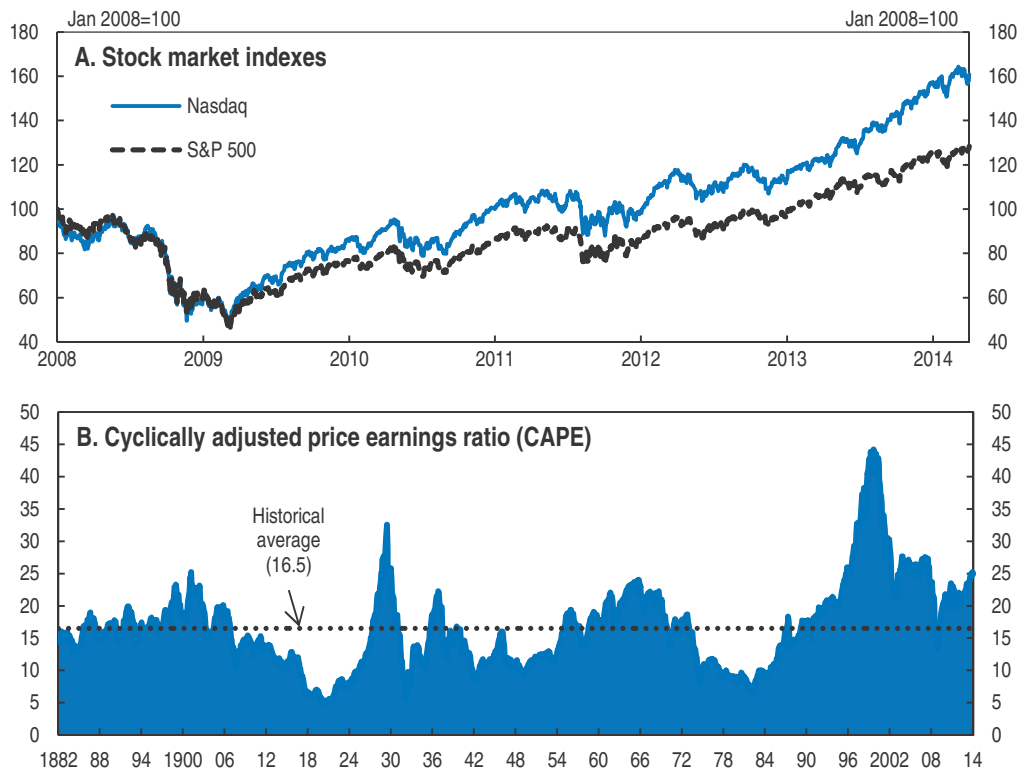
Renewed financial turbulence in emerging market economies (EME) is a downside risk. During 2013, policymaker communications regarding possible reductions in the pace of asset purchases spilled over internationally at times, with financial investors redirecting funds away from some EMEs, thus putting downward pressure on their currencies

Figure 4. **Inflation is running below the FOMC objective**

1. Total employees.

Source: OECD Economic Outlook Database; US Department of Commerce, Bureau of Economic Analysis and the US Bureau of Labor Statistics.

StatLink <http://dx.doi.org/10.1787/888933080998>

Figure 5. **Stock market indexes have reached nominal highs and P/E ratios are above historical averages**

Source: Robert J. Shiller and Datastream.

StatLink <http://dx.doi.org/10.1787/888933081017>

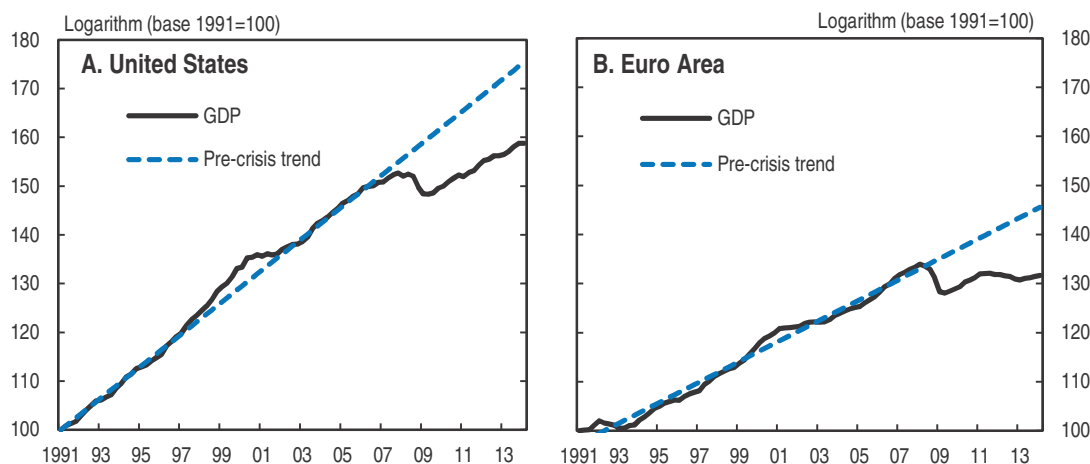
(Rawdanowicz et al., 2014). In the past, large reversals of capital flows triggered by increases in US interest rates contributed to financial crises in EMEs, especially in economies with large current account deficits, high levels of foreign debt and over-valued exchange rates (Calvo et al., 1996; Kaminsky et al., 1999). Abrupt and unanticipated increases in US interest rates could trigger turmoil in EMEs, which could then spill back to the United States (Olaberria, forthcoming). Estimates suggest that a decline by 2 percentage points in EME growth would reduce growth in the United States by 0.4 percentage points (Ollivaud et al., 2014). However, most EMEs are in a better position to absorb such a shock than in past episodes of US monetary policy tightening.

In addition to the risks in the financial markets mentioned above, the economic recovery is subject to other risks. On the negative side, the projected rebound of business investment might not materialise if firms' expectations of growth fall. As well, the recovery of residential investment may not be as strong as projected if mortgage interest rates increase rapidly, if supply bottlenecks become serious impediments and if household formation does not return to normal. On the positive side, improvements in household finances could result in lower saving and more consumption than projected. Economic growth could also be stimulated more robustly than expected by factors such as improved competitiveness and low energy prices. A rapid conclusion of the negotiations on Trans-Pacific Partnership (TPP) and Transatlantic Trade and Investment Partnership (TTIP) would also boost economic growth.


Structural reforms, including comprehensive tax reform, can boost long-term growth

Long-term growth is projected to remain lower than before the crisis. Although the recovery has been more robust in the United States than in most OECD countries, it appears likely that the severity of the financial crisis may have caused a durable loss in the level of output (Figure 6). In addition, growth may be held back by the ageing of population and the possible weakening of productivity growth (Gordon, 2014; Hall, 2014; OECD, 2014c). An environment of slower growth would make it more difficult to address financial, fiscal and

Figure 6. Output after the crisis



Source: OECD Analytical Database.

StatLink  <http://dx.doi.org/10.1787/888933081036>

social challenges. Hence, growth-friendly reforms come with a certain degree of urgency. In addition to tax reform, this includes progress to raise labour-force participation, change immigration laws, help parents with young children and ease access to quality education for lower-income groups.

Tax reform, which has been on the agenda for some time, also has a key role to play (Auerbach, 2006; Altig et al., 2001). The Chairman of the Ways and Means Committee, one of the main Congressional committees responsible for tax legislation, issued a comprehensive proposal in early 2014, which provides a basis on which to move discussions forward. At 39.1%, the statutory corporate income tax rate (when combined with the average of state taxes) is the highest in the OECD and well above the OECD average of 25.5%. However, the corporate income tax base is narrow and effective rates vary widely across business sectors, limiting revenue and imposing large investment distortions. Cutting the statutory marginal corporate income tax rate and broadening its base would also lower the incentive to shift business activity to non-corporate forms and support long-term growth (Arnold et al., 2011).

Another consequence of the current international tax rules is that multinational firms avoid paying taxes by using a host of legal provisions to narrow their tax base and shift their profits to low-tax foreign jurisdictions. The magnitude of these operations is so large that some multinational firms pay very low taxes, despite being highly profitable. In the current context of fiscal constraints and severe loss of trust in institutions, it is important that these firms pay their fair share of taxes. Taxes unpaid by multinational firms transfer the tax burden to everybody else, hence imposing distortions on other sectors. Reforms to combat base erosion and profit shifting (BEPS) would go a long way towards achieving this goal (Box 1) and towards supporting overall tax reform efforts by levelling the playing field. In this regard continued US leadership on the BEPS project is crucial for ensuring that such reforms are consistent and co-ordinated across countries.

Box 1. Base erosion and profit shifting (BEPS)

Base erosion in business income taxation through the exploitation of tax relief has also been accompanied by extensive profit shifting to no-tax or low-tax jurisdictions by US multinational enterprises (MNEs). As in other countries, significant numbers of these firms exploit domestic and international tax rules to reduce the effective tax rates on their worldwide profits to low levels, especially where they can keep profits offshore. This is evident in the rise in repatriated profits with the temporary reduction in the tax on repatriated profits in the 2004 America Jobs Creation Act. The current US business tax system for multinationals provides an incentive to keep profits abroad (estimates of the amount held offshore are as high as USD 1.9 trillion) and makes investment abroad more attractive. The G20 has voiced concerns about base erosion and profit shifting by MNEs and has recognised that no single country acting alone can effectively address these issues. Options for corporate tax income reform currently being debated in the US include: significantly lowering the statutory corporate income tax rate and taxing foreign affiliates' profits as they are earned, changing to a territorial tax system and exempting dividends and other payments made by foreign affiliates, or introducing an intermediate solution, such as a territorial system combined with a minimum tax on foreign income.

Similarly, simplifying the personal income tax to eliminate exemptions and other complicated features would raise the efficiency of taxation and lower the cost of tax compliance. Many taxpayers need to hire a tax preparer just to file their tax returns. For example, a proposal to simplify tax returns for up to 40% of Americans was estimated to save 225 million hours and USD 2 billion in tax preparation fees (Goolsbee, 2006). Income tax statements pre-filled by the tax administration based on information available to them, as in France, Sweden and other OECD countries, would go a long way towards easing the burden of taxpayers. Although many income tax relief provisions seek to protect the poor, others end up benefiting mostly households in the highest quintile (CBO, 2013a). The recovery in the housing market provides an opportunity to reduce or remove mortgage interest relief for owner-occupiers, which is one of the costliest tax expenditures and is not matched by the taxation of owner-occupied imputed rental income (OECD, 2011). The US tax system was already reformed in the past to curb interest deduction on consumer loans, credit cards, second homes and to cap the deduction on principal residences. Experience in other countries such as the United Kingdom and France demonstrates that phasing in caps (or phasing out the deduction altogether) can be successful.

The exclusion of employer-provided health insurance from individuals' taxable income encourages costly insurance premiums and causes an excessive consumption of healthcare services (OECD, 2008; Carey et al., 2009). Even though provisions in the Affordable Care Act (ACA) seek to discourage high-cost insurance plans, eliminating the exclusion altogether remains important to realign incentives. Nonetheless, without the tax exclusion, companies may cease to provide health insurance as part of their compensation package. It is therefore important to have a well-functioning individual insurance market available to workers losing their employer-paid health insurance, which is one of the goals of the ACA.

Financial reform should be rolled out fully

Work is underway to strengthen the resilience of the financial sector. The Federal Reserve conducts every year a Comprehensive Capital Analysis and Review (CCAR) of bank holding companies, which evaluates their capital adequacy and their plans to make dividend payments or stock repurchases. As financial intermediaries increasingly use innovative financial products that can improve their apparent resilience, the Federal Reserve considers the ability of banks to conduct their own stress tests (data, models, scenarios) and the quality of capital planning processes when assessing banks' capital adequacy plans. Also, systemically important financial firms are required to meet additional capital and leverage surcharges and to hold higher quality liquid assets than smaller financial institutions. This seeks to address the "too-big-to-fail" market failure, which can induce excessive risk-taking if the banks believe that they will be bailed out rather than allowed to go bankrupt. Work is also ongoing to strengthen resilience through creating a framework that will allow large banks to fail, including with changes to resolution regimes.

The Volcker Rule prohibits banking entities from engaging in short-term proprietary trading, in order to protect deposit-taking and retail activities. Although the overall framework has been defined, questions remain in distinguishing between proprietary trading, hedging and market-making activities. In this light, implementation of the rule by the five supervisory bodies responsible will be central to its success in the framework of the

Financial Stability Oversight Council led by the US Treasury. An additional complication may arise if limits on proprietary trading rules have the effect of diminishing liquidity of US and international markets. This is another area requiring careful monitoring of implementation.

Apart from the risks posed by large banks, macro-prudential policy also focuses on the “shadow banking system”, i.e. institutions that engage in credit intermediation and maturity transformation outside the insured depository system. Vulnerabilities prevail in the volatile short-term wholesale funding market, in money-market mutual funds that could “break the buck” and in the tri-party repo market where collateral cannot as easily be liquidated because of the risk of instigating a “fire sale” of securities. The migration of transactions outside the perimeter of entities able to provide deposit insurance and access to lender of last resort facilities increases the risk of unchecked panic runs, with the possibility of system-wide contagion. Progress is being made to contain these vulnerabilities with prudential tools and regulation, though more work is needed.

Two government-supported enterprises (GSE) specialised in the securitisation of conventional mortgage loans, Freddie Mac and Fannie Mae, incurred very large losses and were put in conservatorship when the crisis struck. Although they are now on a firmer financial footing, recent stress tests mandated by the Dodd-Frank Act have suggested that they would require between USD 84 billion and USD 190 billion from the Treasury Department under adverse scenarios. Reform is thus needed to lower risk and to reduce the government’s role in the mortgage market. The Senate Banking Committee adopted in May 2014 proposals with this intent (Box 2). Johnson-Crapo GSE reform seeks to reduce the risk to public finances by ensuring that private capital takes a bigger role in the mortgage market but leaves in place a government backstop, which is rarely found in other OECD countries, and represent a contingent liability for the federal budget.

Box 2. **GSE Reform**

The Senate Banking Committee passed in May 2014 a bipartisan proposal (“Johnson-Crapo GSE reform”) seeking to reform the housing finance system, create greater competition and reduce taxpayer risk, while ensuring affordable, fair access to all creditworthy homebuyers. If enacted, the legislation would wind down and eliminate Fannie Mae and Freddie Mac and allow for a diverse set of private entities to step in and replace most of their functions. The new system would be regulated by the newly-created Federal Mortgage Insurance Corporation (FMIC), modelled in part after the Federal Deposit Insurance Corporation (FDIC). It would also create a catastrophic insurance fund, known as the Mortgage Insurance Fund (MIF), to protect taxpayers. The legislation foresees that the government would provide financial support only in a tail loss position after the private sector has taken the first loss; it also requires that the MIF keep a minimum 2.5% capital against its guarantee of mortgage-backed securities.

An important lesson from the financial crisis is that household debt, when it reaches unsustainably-high levels, can have severe consequences for the financial system and, more broadly, for the economy. Five years after the crisis a significant percentage of homeowners with a mortgage continue to be “underwater” (they owe more than their homes are worth) and, for many, the depth of negative equity is still substantial (Federal Reserve, 2014). Safeguards against excessive mortgage debts or inadequate mortgage loan terms are therefore important, which are now provided by the Consumer Finance Protection Bureau’s mortgage regulations.

With these various actions, the United States has gone a long way towards implementing a macro-prudential approach to supervision and regulation – an approach that focuses on the financial system as a whole as opposed to the health of individual firms. Monitoring financial stability involves tracking vulnerabilities, such as leverage, maturity transformation, asset valuations, and interconnectedness, in systemically-important financial institutions, shadow banking, asset markets, and the non-financial sector. It also involves evaluating the interaction between macroeconomic imbalances, monetary policy settings and financial stability. Reflecting the close interactions between these three dimensions, the Federal Reserve Board has usefully extended its semi-annual *Monetary Policy Report* to discuss financial stability issues, including aspects that have been challenging in the past such as household debt and vulnerabilities in the overall financial sector (Federal Reserve, 2014). This is a welcome development as it informs the public about the Fed’s views regarding risks of financial imbalances. The Fed is encouraged to continue in this direction, especially in the discussion of macro-prudential policy responses, as is done by central banks in other OECD countries (Wilkinson et al., 2010).

Labour market reform can boost employment

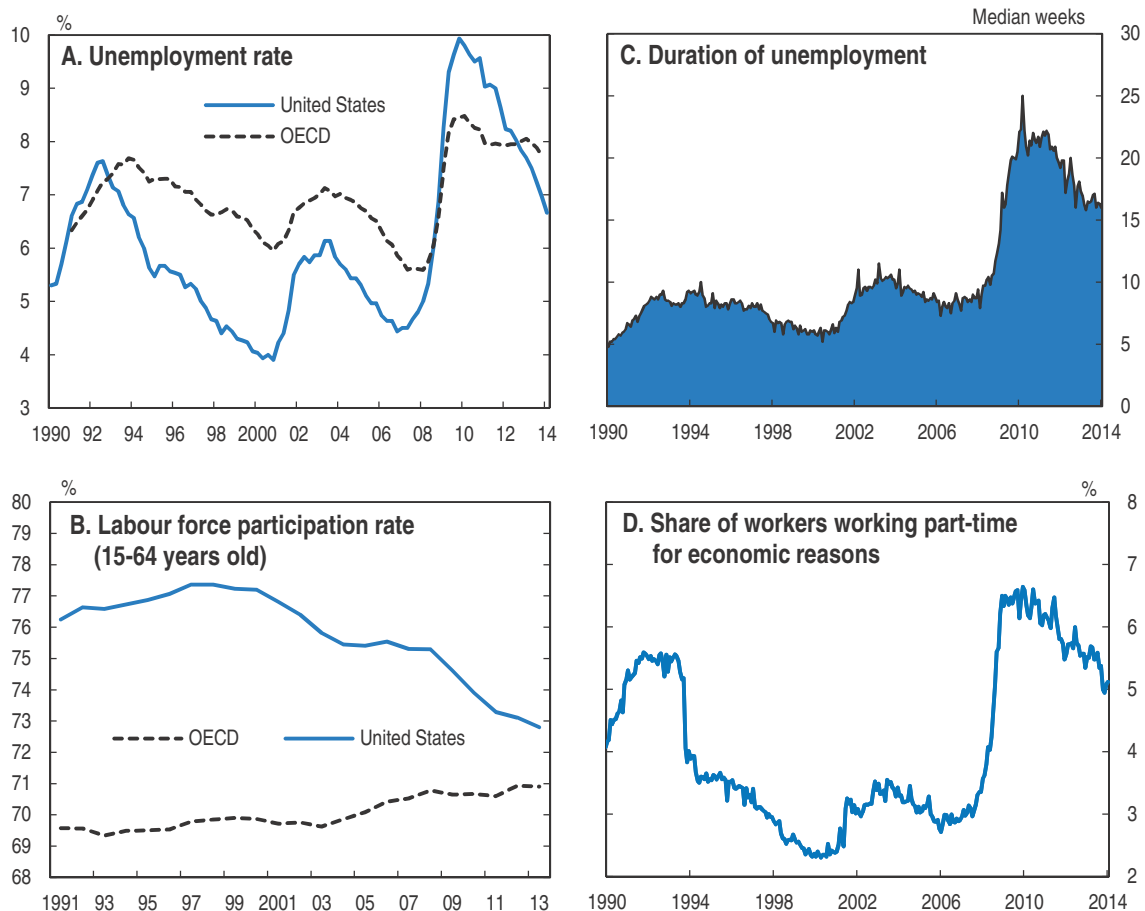
The unemployment rate has fallen from a peak of 10% in late 2009 to about 6.3% in early 2014 (Figure 7, Panel A). Other labour-market indicators are, however, less positive:

- The participation rate (those in employment or who are looking for work between the ages of 15 and 64) fell from 75% in 2007 to 73% in 2013 (Figure 7, Panel B). A large share of the decline in participation since 2007 reflects population ageing and exits into retirement; estimates range from one third to two thirds of the decline being due to population ageing.
- Exiting unemployment remains challenging: only 15% of those who have been short-term unemployed occupy a steady full-time job one year after getting a job (Krueger et al., 2014) and less than 10% of those who have been long-term unemployed do so.
- Long-term unemployment remains high compared with pre-crisis averages (Figure 7, Panel C).
- About 5% of employed workers have a part-time status due to economic reasons (defined as individuals working less than 35 hours per week, but report they would like to work more hours), about twice the pre-crisis level (Figure 7, Panel D).


Altogether, significant slack continues to prevail in the labour market (Reifschneider et al., 2013) with no significant wage pressures.

The decline in the labour force is particularly worrying, and calls for policies to encourage the participation of those outside the workforce (about one-third of those aged 16 years and over). In addition to policies such as immigration reform, schemes under the Trade Adjustment Assistance Program for displaced workers reduce the mismatch between the supply and demand of skills. However, the federal government has devoted relatively few resources to active labour market policies in comparison with other OECD countries. State governments are playing an increasing role in adult training, in part to attract out-of-state investment in new production facilities (Center for Regional Economic Competitiveness, 2014; National Governors Association, 2014). The economic benefits of such funding is constrained by the limited transferability of training credentials, because out-of-state employers are unable to verify if training genuinely translates into

Figure 7. Labour market trends are mixed



Source: OECD, Labour Force Statistics Database and US Bureau of Labor Statistics.

StatLink  <http://dx.doi.org/10.1787/888933081055>

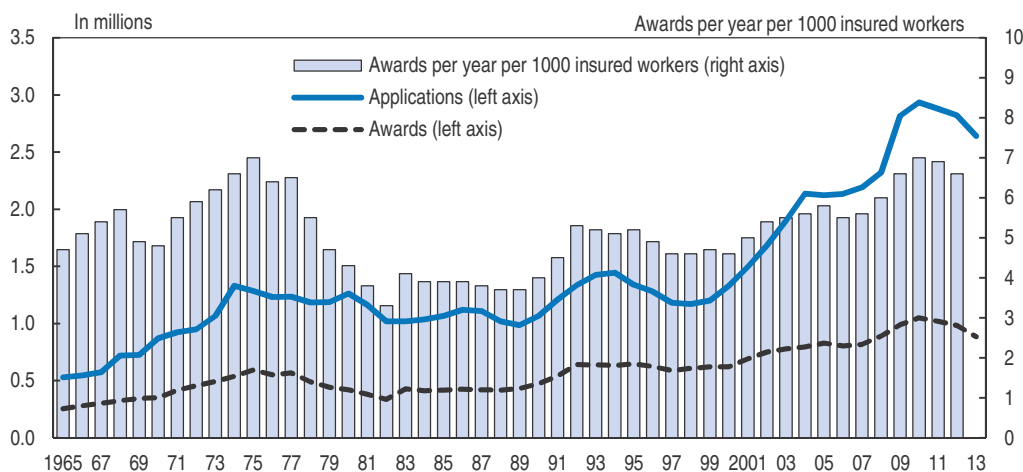
actual skills. The federal and state governments should engage in a dialogue with employers and educators to strengthen the credentials of training programmes, possibly through standardised curriculums and external evaluations.

The OECD study on adult skills (PIAAC) identified a large proportion of American adults with weak literacy and numeracy skills, most of them in low-paid jobs and many of them young. Participation in adult learning is relatively high, and many young adults return to college to complete their education (OECD, 2012, OECD, 2013a). However, many of them drop out, often because of basic skill weaknesses or because of financial challenges. As noted in the 2012 OECD Economic Survey and Dunn (2013), better wraparound services, such as childcare, tuition assistance, and other types of income support could improve completion rates, in particular for workers who support their families and cannot participate in long periods of training while working and attending to their caring responsibilities. The quality of training would be improved by strengthening quality assurance, establishing better links to industry and including workplace training as a key element of post-secondary education (OECD, 2013a; OECD, 2014a).


Employers also have a role to play in up-skilling the workforce. Empirical evidence shows that providing jobs with low wages, minimal benefits, little training, short hours and erratic schedules, while helping to keep costs down, is often not a good business strategy. Firms that offer full-time contracts and invest in good jobs are often rewarded by higher profits and stock-market valuations (Ton, 2013). Workers and employers both stand to gain from the better quality of jobs, which in turn can improve worker productivity, recruitment and retention (Cauthen, 2013). Stronger involvement of employers in the design of training programmes would be one way to encourage this transformation and ensure greater portability and recognition of training. Developing partnerships between education institutions and the private sector, as is done in some states, with a particular emphasis on those between local employers and community colleges, would be particularly helpful.

The number and rate of disability income awards have increased over the past 20 years, due largely to the aging of the workforce and the past rise in the female labour force. In line with past recessions, awards increased and then decreased with the crisis since 2008 (Figure 8). A risk is that it can be difficult to get people back into the labour force once they have qualified for disability insurance (OECD, 2010). International experience shows that early intervention programmes that help individuals who are capable to return to work quickly, as in the case of Switzerland, can be effective in avoiding disability recipients permanently exiting the labour force (OECD, 2014b). Re-examining eligibility rules, notably for disability related to mental illness (Autor, 2011), is also warranted to prevent possible misuse. In addition, some individuals effectively drop out of the labour market, in part because they believe that working is penalised during the application process. Applicants should be informed that working during the application process will not be penalised. Furthermore, the process should be shortened to reduce scarring effects, which make re-entering the labour market more difficult. In the United States, disability recipients are normally reassessed every 3-7 years depending on the nature and severity of the condition. Providing sufficient funding to ensure such reviews occur more frequently would reduce the budgetary burden of the programme and increase employment.

Figure 8. Disability benefit applications and awards have increased



Source: Social Security Administration.

StatLink  <http://dx.doi.org/10.1787/888933081074>

Recommendations for macroeconomic management

Comprehensive tax reform

- Cut the marginal corporate income statutory tax rate and broaden its base, notably by phasing out allowances.
- Act towards rapid international agreement and take measures to prevent base erosion and profit shifting (BEPS).
- Make the personal tax system more redistributive by restricting regressive income tax expenditures.

Macroeconomic policy and financial stability

- Fiscal policy needs to remain cautious and prepared to take actions to ensure longer-term sustainability.
- Gradually reduce and ultimately remove monetary accommodation as the economy approaches full employment and inflation returns to the Fed's 2% target.
- Continue to roll out macro-prudential policy tools, including those associated with the Dodd-Frank Act and those that address vulnerabilities in wholesale funding, repo market and money-market mutual funds.
- Reform the housing finance system to ensure access to mortgage credit of creditworthy homebuyers while providing better guarantees of financial stability and avoiding again exposing taxpayers to costly bailouts.

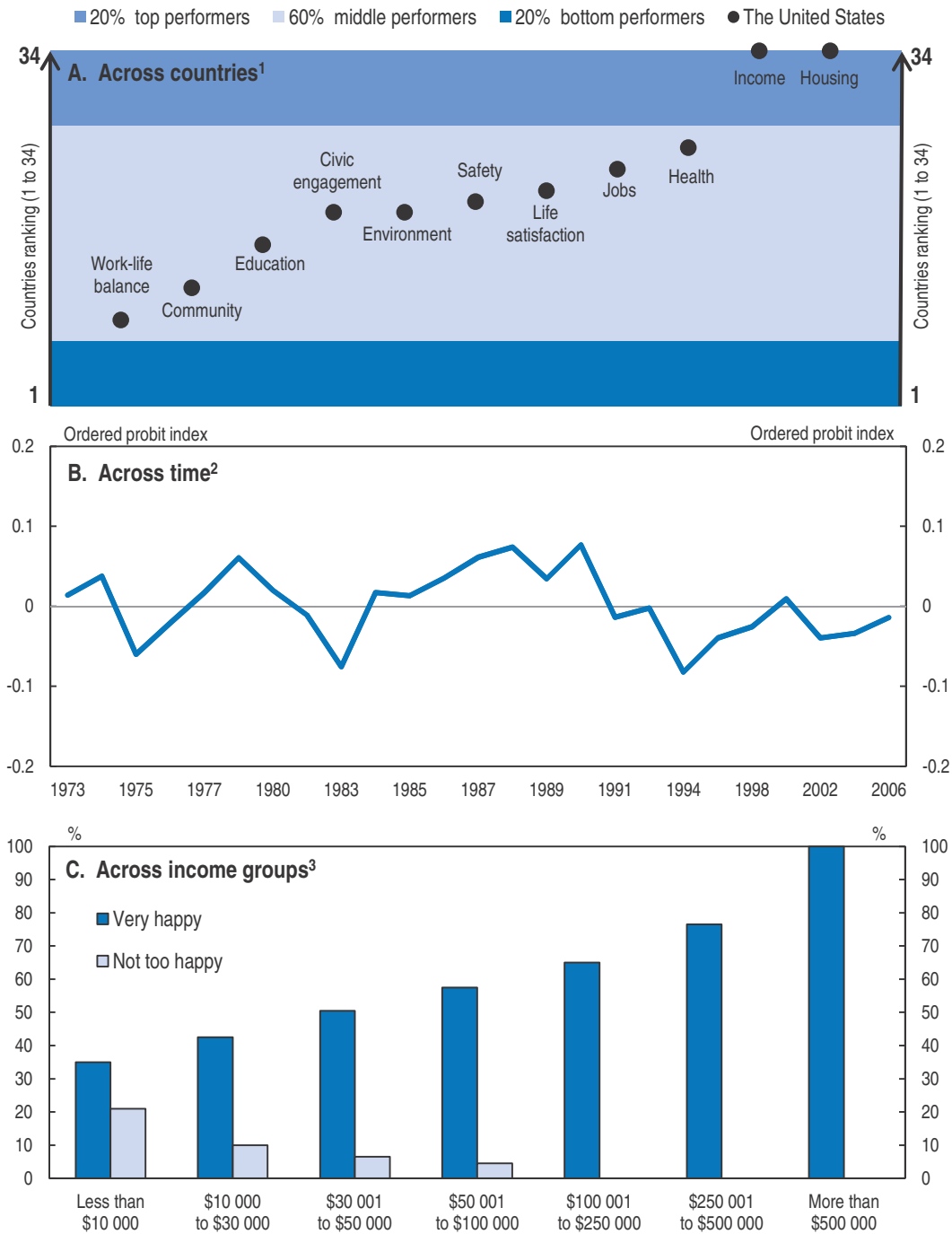
Further recommendations

- Simplify personal income taxes to reduce compliance costs and improve transparency.
- Strengthen policies to reintegrate the long-term unemployed into employment.
- Provide comprehensive work supports to encourage disability recipients to work, in particular with pilot programmes aimed at evaluating the effectiveness of measures facilitating the return to work.
- Make it clear to disability applicants that they are allowed to work while waiting for their application to be considered.

Americans are generally happy, although working families face rising pressures

Because GDP growth is not always associated with high levels of life satisfaction, attention has been increasingly paid to well-being. Compared to other countries, the United States enjoys high levels of well-being across many dimensions (Figure 9, Panel A). Nonetheless, happiness appears to have remained flat over the past 30 years (Figure 9, Panel B), although substantial measurement uncertainty affects these estimates. In addition, as in all countries, happiness varies considerably across socio-economic groups (Figure 9, Panel C). High-income households have benefitted from fast increases in their market incomes (Figure 10) and report high levels of happiness. Middle-income households report lower levels of happiness: they have neither benefited from social transfers targeted at the poor, nor experienced the gains in market income enjoyed by higher-income groups – a development often characterised as the “hollowing-out” of the middle-class (Förster and Pearson, 2002). Households in the bottom 20% have benefitted from rising transfers, primarily benefiting poorer households (CBO, 2013b), but still report low levels of happiness.

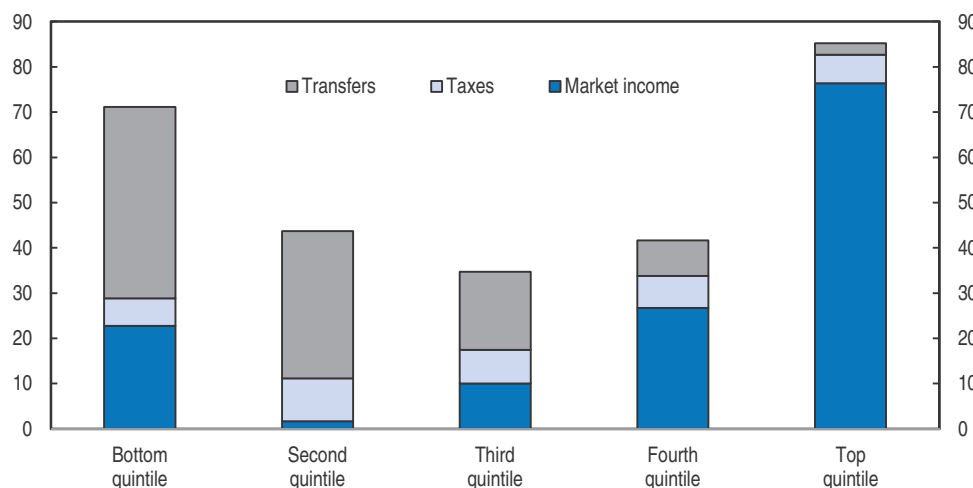
Figure 9. Well-being is high, but not for all



1. Source: OECD (2013). *How's Life? 2013 Measuring Well-being*.
 2. Happiness data are aggregated into a happiness index by running an ordered probit regression of life satisfaction on year fixed effects. Source: Stevenson and Wolfers (2008), based on data from US General Social Survey.
 3. Source: Stevenson and Wolfers (2013), based on Gallup Poll. Percentage of household by annual household income.


StatLink <http://dx.doi.org/10.1787/888933081093>

Figure 10. **Income growth has varied considerably across groups**¹
 Percentage change of real disposable income during 1979-2010 per income quintile



1. Market income consists of labour income (including employer-paid health premiums), business income, capital gains, other capital income and retirement income. Transfers include cash payments and in-kind benefits from social insurance and other government assistance programmes. Taxes include all federal taxes owed on the basis of income, payroll taxes paid through employers, excise taxes, and corporate income taxes allocated according to households' share of capital and labour income. Income groups are created by ranking households by before-tax income.

Source: CBO (2013), *The Distribution of Household Income and Federal Taxes*, 2010.

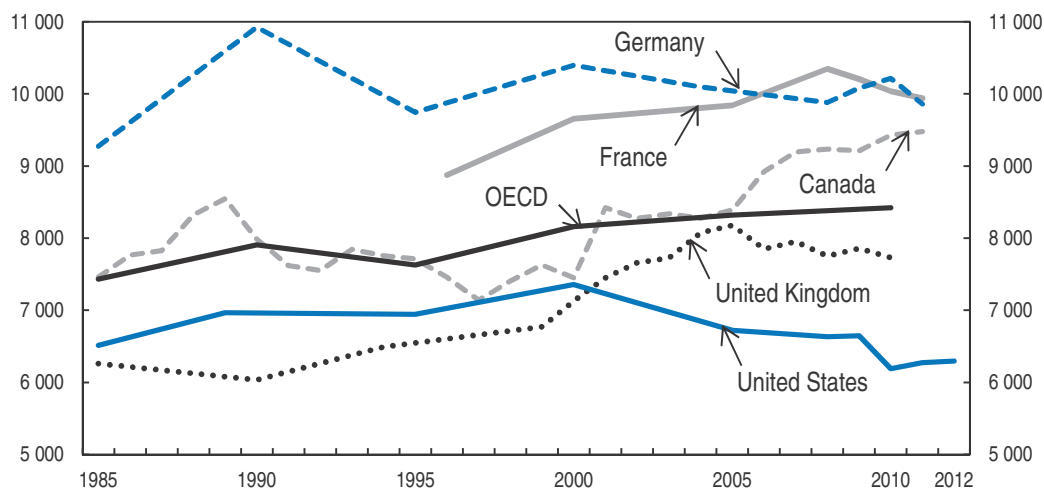
StatLink  <http://dx.doi.org/10.1787/888933081112>

Boosting earnings of the working poor

Low-income families face tough conditions, especially when they do not have good jobs that neither ensure adequate standards of living nor provide stability. This reflects different forms of precarious employment, such as involuntary part-time jobs and frequent moves between low-paid work and joblessness. In the pre-crisis years (2000-08), labour incomes for the poorest 10% actually fell by 10% in real terms (Figure 11). Thus, poverty remains a problem: in 2010, 12% of households with at least one worker experienced in-work relative poverty, while 8% of those living in households with all adult members employed were in poverty, both shares being above the OECD average (OECD, 2013b). Many of these households have children at home and are headed by single mothers. These families account for a significant share of those who are income poor and contribute to one of the highest child poverty rates in the OECD. Public support for families, including childcare support, plays a limited role by OECD standards. The rising participation of women in the labour force (Figure 12) has helped families maintain financial security, and affordable technology has reduced the time devoted to homecare, but nonetheless most families have less free time for leisure and sleep (Pew Research Center, 2013).

The federal Earned Income Tax Credit (EITC) has been effective in fighting poverty and encouraging work. It could become even more effective in helping to bring non-participating and irregularly-participating people to the labour market, for instance by extending it to childless workers (who receive very little EITC, or none), non-custodial parents and lowering the age eligibility threshold from 25 to 21. Empirical evidence however suggests that about 40% of the EITC is captured by employers through reduced compensation (Rothstein, 2010).

Figure 11. Cash incomes of bottom 10% have stagnated
Average real disposable income of bottom 10% (excludes in-kind transfers)¹

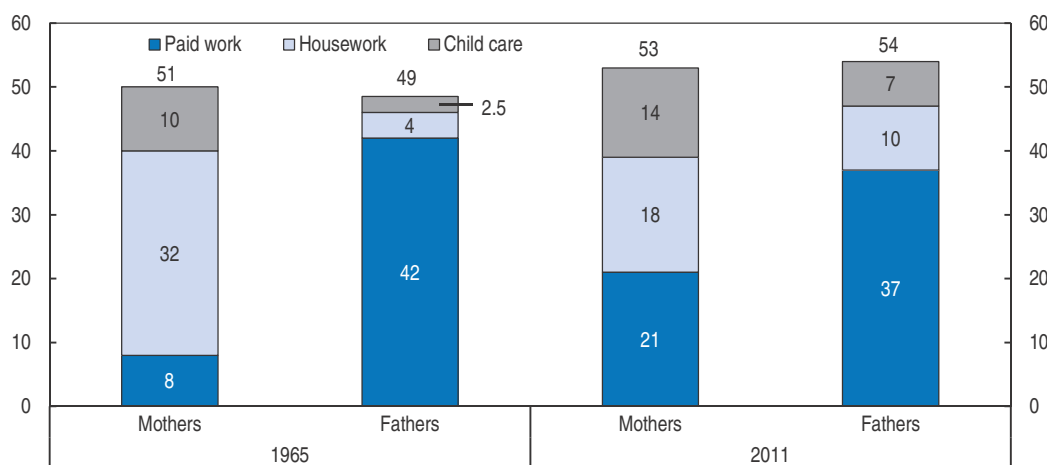


1. Constant prices in 2010 dollars converted to international dollars using purchasing power parities related to private consumption. OECD average: un-weighted and based on 12 countries for which data are available at all points (Canada, Denmark, France, Germany, Israel, Italy, Netherlands, New Zealand, Spain, Sweden, the United Kingdom and the United States). Data for 2011 and 2012 are provisional.

Source: OECD Income Distribution Database (2013), www.oecd.org/social/income-distribution-database.htm.

StatLink <http://dx.doi.org/10.1787/888933081131>

Figure 12. American families are facing rising time pressures¹
Average number of hours per week

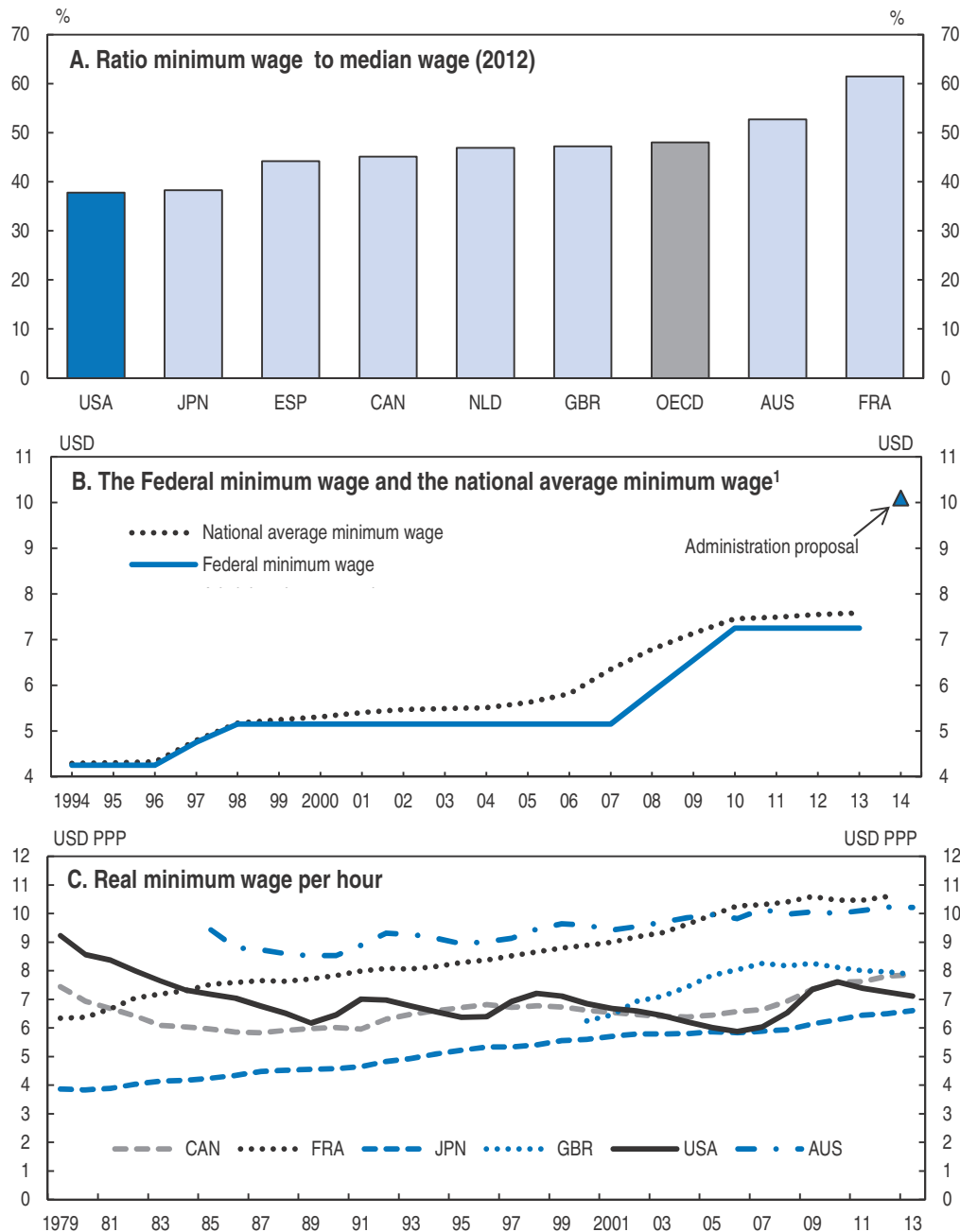


1. Based on adults ages 18-64 with own child(ren) under age 18 living in the household. Total figures (at the top of each bar) may not add to component parts due to rounding.

Source: Pew Research Center (2013).


StatLink <http://dx.doi.org/10.1787/888933081150>

The minimum wage helps workers benefit more fully from the EITC, though its current low level reduces its relevance. The value of the minimum wage has declined significantly in real terms over time, notwithstanding a phased increase between 2007 and 2010 from USD 5.15 to USD 7.25 (Figure 13). Relative to the median wage, the current federal minimum wage is well below the average statutory minimum wage in OECD countries. The effects on low-skilled jobs of raising the minimum wage are uncertain. Some research concludes that a limited and gradual increase would have no or

Figure 13. **The US minimum wage has fallen behind**

1. The national average minimum wage is calculated as the average of minimum wages prevailing in each US state, weighted by the percentage share of each state in the US population.

Source: OECD, Labour Statistics Database; US Department of Labor and OECD calculations.

StatLink  <http://dx.doi.org/10.1787/888933081169>

only a small effect (Doucouliagos et al., 2009; Dube et al., 2010; Wolfson et al., 2013). Estimates from the CBO suggest that gradually increasing the minimum wage to USD 10.10 by 2016, as currently proposed, would reduce total employment by about 500 000 workers or 0.3% (CBO, 2014c), although such an estimate comes with a high degree of uncertainty. The effects on employment would be limited because some states already have their own minimum wage, which is higher than the federal level; in addition, the proposed increase

would just restore the minimum wage to its past value in real terms, rather than increase it. Nonetheless, such an increase would benefit a large majority of low-wage workers and raise earnings for an estimated 12 million people now in poverty (CEA, 2014).

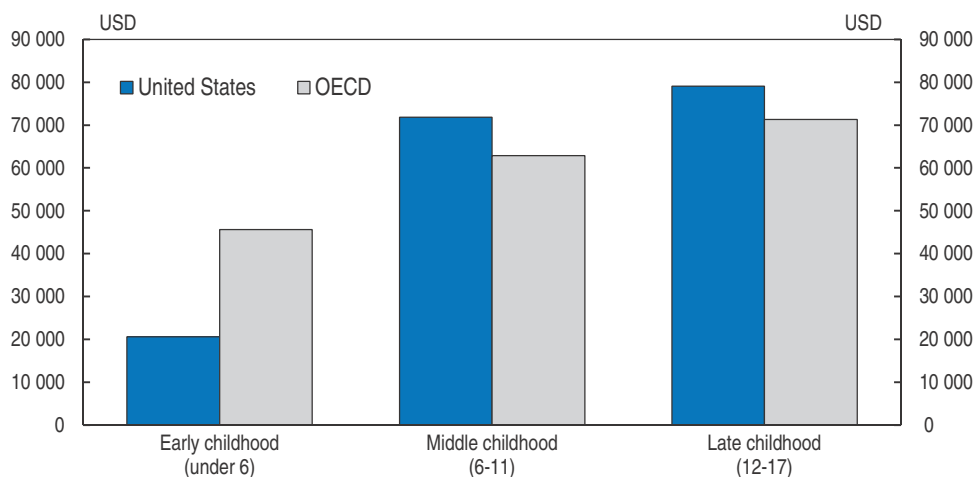
Balancing work and family goals

The work-life balance of American families is made challenging by the duration of working time, which is long (1 790 hours annually) compared to the OECD average (1 765 hours) in 2012 (*OECD Employment Outlook*). While about 18% of workers are part-timers (BLS), full-timers work long hours, including overtime hours. Using the American Time Use Survey, Holtz-Eakin (2013) finds that more than 45% of men and more than 20% of women regularly work more than 40 hours per week. The Fair Labor Standards Act (FLSA) requires that, with some exceptions, employees must receive overtime pay for over 40 hours a week at a rate not less than 1.5 times their regular rates of pay. The legislation excluded senior executives and top-level managers from overtime compensation, but, at present, many workers earning a salary of more than USD 455 per week, which is a relatively low income, can be classified as managers and therefore exempt from overtime. It is thus encouraging that the Administration has proposed to raise this threshold, which has been changed only once since 1975 and thus needs to be adjusted.

Public education spending mostly supports compulsory public education, which typically begins around age 5 or 6 (Figure 14). To relieve pressure on working families, especially underprivileged households, more should be done to improve access to quality early childhood education and care. Spending in high quality preschool and child care is typically the most cost-effective education investment in life (Heckman, 2009; Heckman, 2013). Such spending will not only provide better early education opportunities to more children, but it will also leverage their ability to gain from traditional public education and help parents in employment or wanting to work to balance their breadwinning and caring responsibilities.

Figure 14. The US lags behind in early education spending

Cumulated public spending per child in 2009



Source: OECD, Family Database.

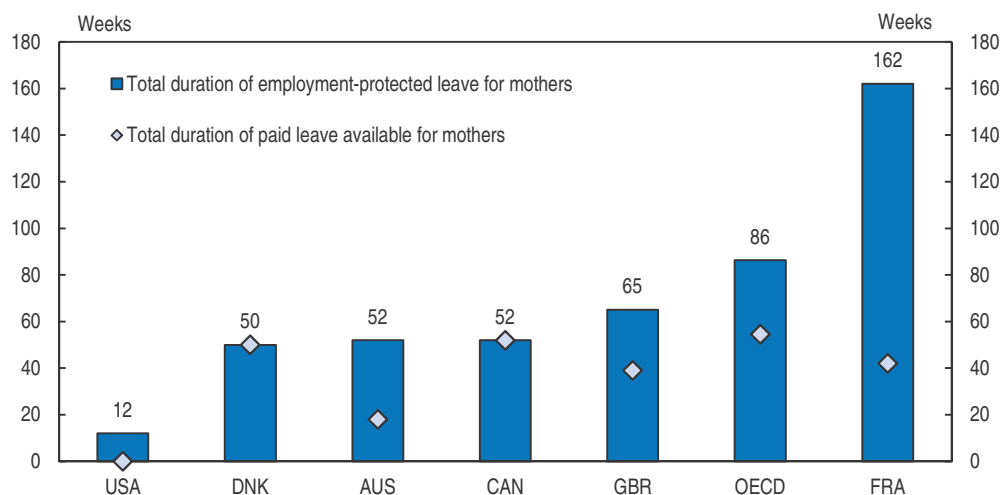
StatLink  <http://dx.doi.org/10.1787/888933081188>

The Administration plans to increase access to pre-school education for 4-years-olds, but there is insufficient access among younger children as well. Some states have low-quality standards and licensing requirements, focusing mostly on very basic health and security. Educators often lack the required skills and competencies to provide quality instruction. Under the Administration's Preschool for All initiative, states would need to meet quality standards to receive federal funds, including requiring preschool teachers to have a bachelor's degree and participate in professional development. Expanding effective targeted interventions – such as Head Start, Early Head Start and evidence-based home visiting programmes – to more children would also help to offset the negative effects of poor socio-economic backgrounds on children, including weak parental involvement.

Working families regularly face conflicts between demanding jobs and family responsibilities. Unlike in other OECD countries, employers rarely allow paid family leave to care for a new-born or a seriously ill family member, and there is no federal law mandating it. Some states require employers to provide paid family leave or other types of support, while some companies do so voluntarily, but overall only 12% of employees have access to paid family leave. When faced with family problems, many workers take sick leave, paid leave, unpaid leave or they leave their jobs altogether (Shriver, 2014). The Family and Medical Leave Act (FMLA) provides some support by allowing workers in large companies to take up to 12 weeks of unpaid leave, but many do not take it or take shorter leave because they cannot afford it. Lack of effective support is possibly most worrying in the case of leave takers following birth (Figure 15). Many employed mothers, even those who get some paid leave from their employers, take less than the 12 weeks recommended by the International Labour Organization to safeguard the health of mother and child.

Beyond health and equity reasons, there are economic arguments for expanding access to paid family leave. Evidence shows that paying income support to mothers strengthens their labour force attachment, reduces turnover costs and public assistance,

Figure 15. **Job protected maternity and parental leave in OECD countries, 2011**^{1, 2}



1. Paid leave consists of maternity, parental and homecare leave. For federal countries, the figures refer to the federal level. The OECD average excludes Chile and Israel.

2. For the US, length of leave refers to 12 weeks of job-protected unpaid leave under the federal Family and Medical Leave Act to care for a new-born, a seriously ill family member or a worker's own serious illness.

Source: OECD, Family Database.

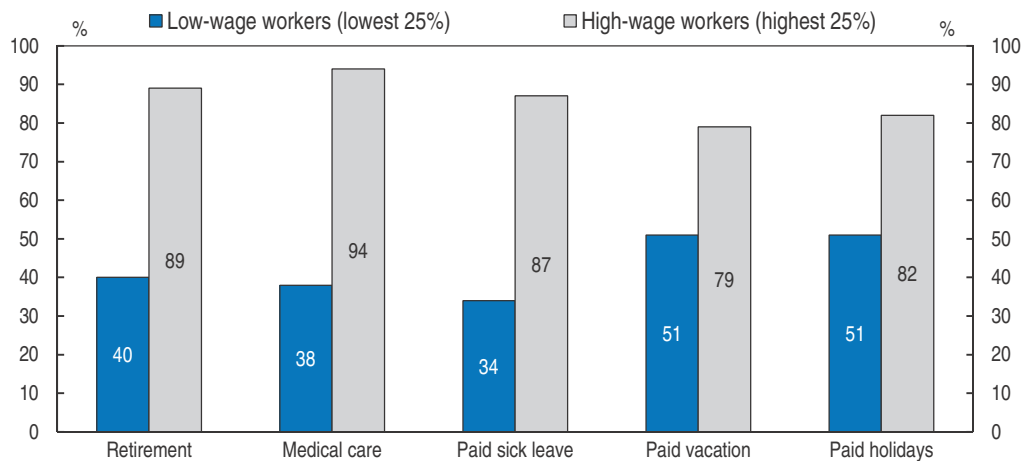
StatLink  <http://dx.doi.org/10.1787/888933081207>

and raises their wages in the long run (Thévenon et al., 2013; Houser et al., 2012). The federal government could build on the successful experiences of California and New Jersey to develop a social insurance programme for paid leave for all workers funded by a small increase in the payroll tax, as proposed by the Family and Medical Insurance Act recently introduced in Congress. Business may be concerned about such policy changes, but evidence from California shows that the introduction of paid leave had little impact on business operations, and some firms even reported positive effects on their productivity and profitability, as well as on employee morale (Appelbaum et al., 2011).

Health policies to mitigate the negative health effects of work-life conflicts


Having a job improves well-being, thanks not only to the positive income effect, but also to the psychological benefits of belonging to a work community (Caldera Sánchez and Tassot, 2014; Barnay, 2014). Yet, for some, the combination of work pressures and family responsibilities can increase stress levels and harm health (Barnay, 2014; Darden, 2014; Dembe et al., 2008). This is particularly the case for low-wage workers with difficult working conditions, including often erratic work schedules, and less access to benefits—such as private health insurance, pensions, and leave entitlements—than high wage workers (Figure 16). Stress and associated poor health of employees can affect companies' performance by reducing the productivity of workers, increasing absenteeism and raising the attrition rates of valuable workers (Gilboa et al., 2008; Darden, 2014).

Figure 16. **Low-wage workers have fewer benefits in the private sector (2013)**



Note: Data refer to all private industry workers and include part-time workers.

Source: US Bureau of Labor Statistics, National Compensation Survey.

StatLink  <http://dx.doi.org/10.1787/888933081226>

The Administration has taken important steps to support the health of those with mental health problems. The 2008 legislation prescribes that health insurance plans offering mental health coverage cannot provide less generous coverage for those services than for physical health services. The Affordable Care Act requires that health insurance plans in the individual and small-employer insurance markets offer coverage for mental health services, that certain preventive mental health services be covered without beneficiary cost-sharing, and contains a variety of measures that increase the affordability of health insurance, particularly for those with pre-existing mental health conditions. Such

measures will not only help those with mental health problems, but can also contribute to stem the productivity losses due to mental health disorders afflicting those at work (OECD, 2010). However, adequate prevention and early intervention are also critical, especially for identifying the negative side effects from stressful working conditions on health. Prevention efforts could be stepped up by monitoring prolonged sick leaves, job losses and disability-benefit claims. Engaging employers could improve awareness about the possible negative side effects of job stress on mental and physical health and improve health outcomes and productivity.

Many American companies have policies in place to help their workers manage their work-life conflicts, such as allowing flexibility in starting and quitting times, or allowing time off when important needs arise. However, more could be done to ensure that these practices benefit more workers, in particular those who work too few hours and for too low pay to financially support their families, and who are more likely to face unpredictable and shifting schedules. Professionals in well-paid jobs could also benefit, as there is evidence that women in some high paying professions are trading flexibility for wages (Goldin, 2014), leading to losses in human capital and undermining efforts to close the gender pay gap. Business would benefit as well, as there is evidence that the costs of jobs stress on their profitability are substantial, through increased health expenditure, absenteeism and diminished productivity (Goetzel et al., 2004; Darden, 2014). Information campaigns to increase awareness of the benefits of policies to improve work-life balance and supporting states in the development of right-to-ask policies, which allow employees to ask for flexible working times to accommodate caregiving responsibilities, could help in this respect.

Recommendations to help working families address rising pressures

Job quality

- Raise labour earnings at the low end by expanding the EITC, which would be more effective supported by a higher minimum wage.
- Strengthen the portability and recognition of training by involving employers in programme design.
- Provide comprehensive work support to get disability recipients back to work.

Work-life balance

- Provide support to parents with young children by expanding access to paid family leave nationally.
- Help states develop right-to-ask policies to support flexible working arrangements.
- Increase access of low and moderate-income families to quality preschool and childcare.
- Work with employers in preventing the negative effects of job strain on mental health, prolonged sick leaves, job loss and disability-benefit claims.

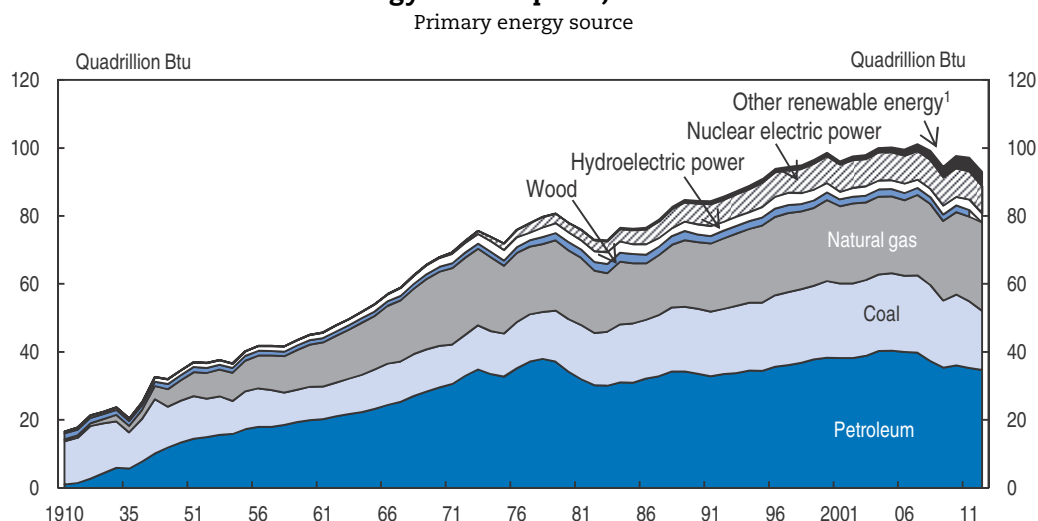
Further recommendations

- Define and enforce minimum quality benchmarks for preschool and childcare.

Making the best of new energy resources

The sustainable use of natural resources can support economic growth and secure future well-being. The United States is well endowed with natural resources, which still play an important role in fuelling economic growth. Most recently, the boom in shale oil and gas production is having important implications for energy use and the environment. Although hydrocarbons account for the majority of energy consumption in the United States, the recent growth in the consumption of natural gas and declines in coal and oil consumption are contributing to reducing CO₂ emission (Figure 17). However, the rapid development of shale resources has outpaced the provision of needed transportation infrastructure, raising concerns about safety. Carbon intensity is further reduced by the growth of renewable energies. Although they represent only a small share of energy supply, solar and wind power capacity have both more than doubled since 2008. In this context, harnessing natural capital effectively raises issues about how to maximise the economic benefits and ensure longer-term sustainability while taking into account the impact on the environment and the risk of accidents.

Figure 17. **Natural gas has increased its importance in energy consumption, 1910-2012**



1. Geothermal, solar/PV, wind, waste, and biofuels.

Source: US Energy Information Administration.

StatLink  <http://dx.doi.org/10.1787/888933081245>

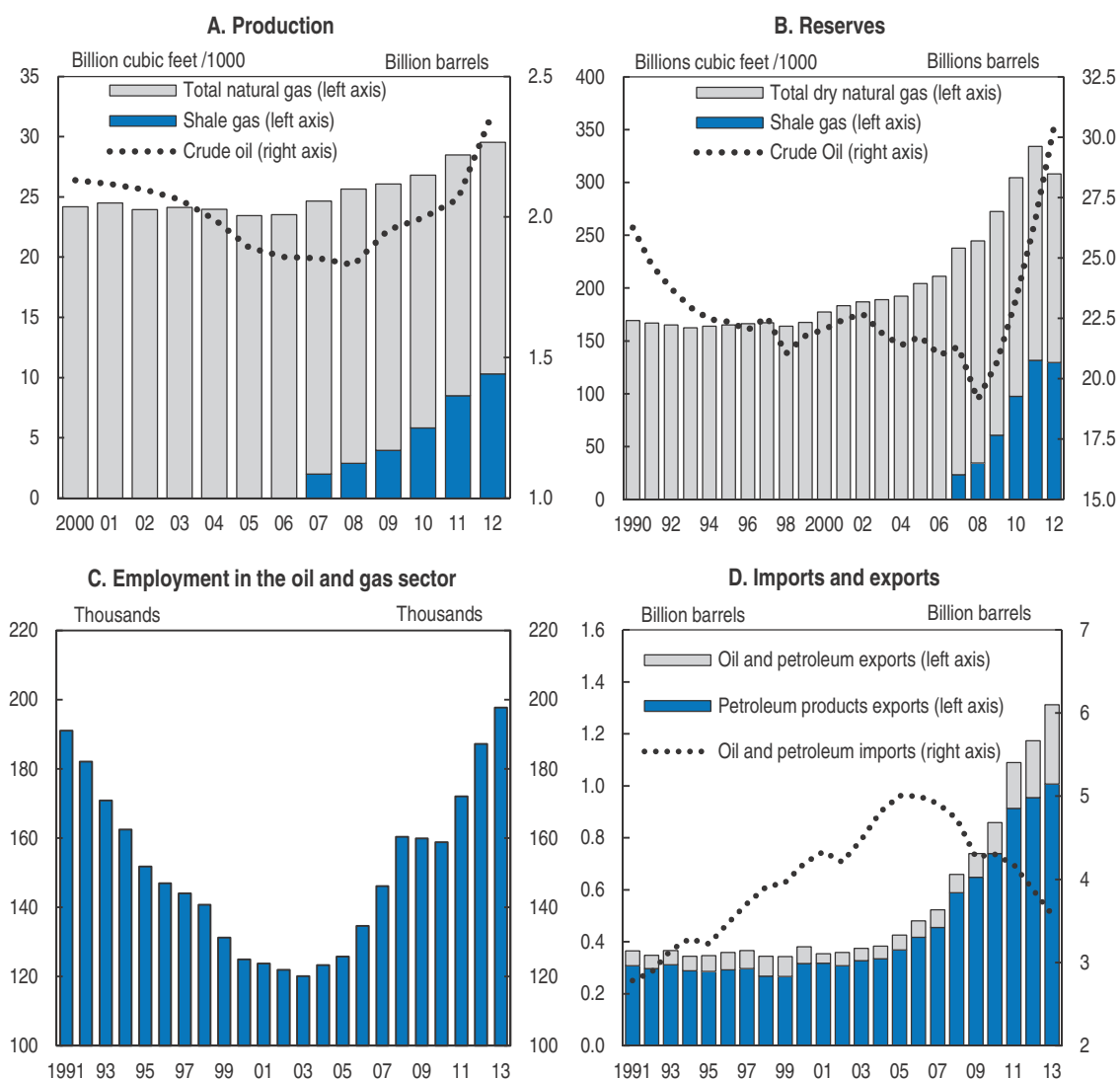
Natural capital represents a relatively small share of overall wealth in the United States, which is dominated by intangibles or human (and health) capital (Arrow et al., 2012). Nevertheless, on a per capita basis, calculations for the early 2000s ranked the United States 11th in the world according to the abundance of natural capital and 15th with respect to sub-soil mineral resources (World Bank, 2006). Subsequently, technological developments involving horizontal drilling and hydraulic fracturing have almost doubled recoverable natural gas reserves. Proven shale oil and shale gas reserves now account for 10% and 40% of total oil and gas proven reserves in the United States, respectively. Strong growth in oil and gas extraction – with oil production increasing almost 50% between 2008 and 2013 and gas production rising over 20% during the same period – has increased the sector's share in GDP. Forecasts suggest that production of shale gas will continue to grow strongly until at

least 2040 when it will account for one half of natural gas produced in the United States (EIA, 2013). The picture for production of shale oil is similar, but with the share of total oil production peaking before 2030 and then declining.

Substantial economic benefits will arise from hydraulic fracturing

The resurgence in US oil and gas production has raised employment in the sector (Figure 18). Exports of natural gas and (particularly) refined products have increased, while imports have sharply declined. According to BEA data on value-added of the oil and gas mining industry, real GDP growth has been directly boosted by only around 0.15 percentage points annually since 2007, but by 0.35 percentage points in 2012; in addition, there are indirect upstream and downstream effects on GDP that are not included in these estimates. Employment increases in energy-intensive sectors, such as chemicals, have also been limited due to their capital-intensive nature, but are likely to grow. As shale oil and

Figure 18. **The energy sector is expanding**



Note: Crude oil includes shale oil.

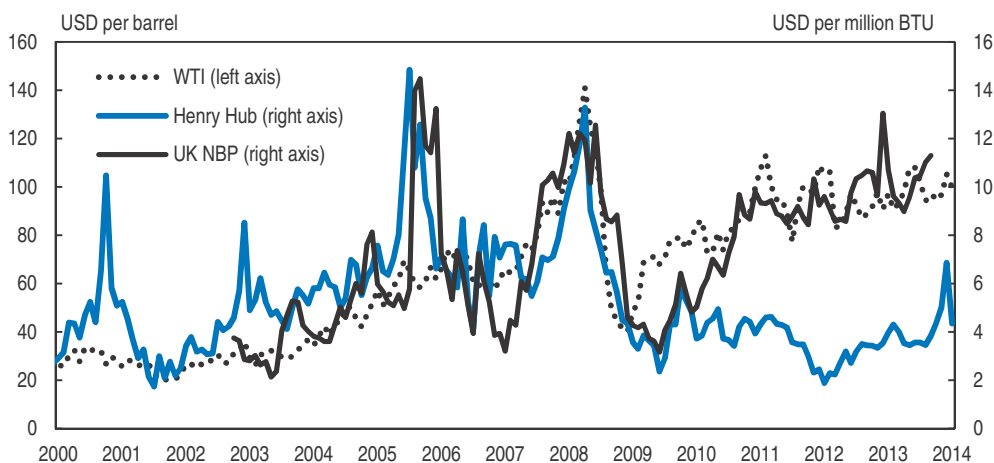
Source: US Energy Information Administration (EIA) and the US Bureau of Labor Statistics.

StatLink  <http://dx.doi.org/10.1787/888933081264>

gas production is set to continue to grow strongly, the boost to competitiveness, along with comparatively muted labour cost growth, will likely contribute to stronger export growth in energy-intensive sectors (Celasun et al., 2014).

US energy has become cheaper, with domestic energy prices falling below international levels. The relationships between oil prices (WTI) and natural gas prices (Henry Hub) have weakened since mid-2008 (Figure 19), coinciding with the largely unanticipated rapid pick up in shale oil and gas production. The decoupling of US natural gas prices from international prices (such as the British National Balancing Point (NBP) price) was particularly pronounced as natural gas supply surged; they fell to around one quarter of the natural gas prices in Europe and Asia before recovering somewhat as exploration activity and production switched towards shale oil. Given liquefaction, transportation and regasification costs, the wedge between domestic and international natural gas prices is likely to be persistent. Export of natural gas to countries without free-trade agreements with the United States requires prior approval from the Department of Energy, for which there is an established authorisation process. The Administration should ensure that energy exports are promptly approved.

Figure 19. **US natural gas prices have diverged from oil prices and international gas prices**



Note: BTU (British Thermal Units); WTI is the price for West Texas Intermediate crude oil; Henry Hub is a benchmark natural gas price in the United States; UK NBP (National Balancing Point) is a benchmark natural gas price in the United Kingdom.

Source: Bloomberg and International Energy Agency.

StatLink  <http://dx.doi.org/10.1787/888933081283>

Limited export-oriented infrastructure also currently constrains natural gas exports. Although more than 9 billion cubic feet of export facilities have been granted conditional permits from the Department of Energy and roughly 2 billion cubic feet per day have received final permits, LNG export facilities are massive and require years to construct. Investment in pipelines and other transportation infrastructure, which are undertaken by the private sector, will be important to ensure the economy can reap the full benefits of the shale boom. Given significant fixed costs and irreversibility associated with these investments, measures that reduce uncertainty support the development of transportation and associated infrastructure. In this context, a stable policy regime, including for climate change (see below), acquires some importance.

In the oil sector, legal restrictions on crude oil exports in place since the 1970s do not prevent the exports of refined petroleum products. However, foreign sales may be limited to the extent that refining capacity and transportation infrastructure are insufficient to handle the available supply. The Administration is considering options under current law to allow exports of crude oil. Another approach would be to abolish the prohibition of crude oil exports altogether.

Hydraulic fracturing affects the environment

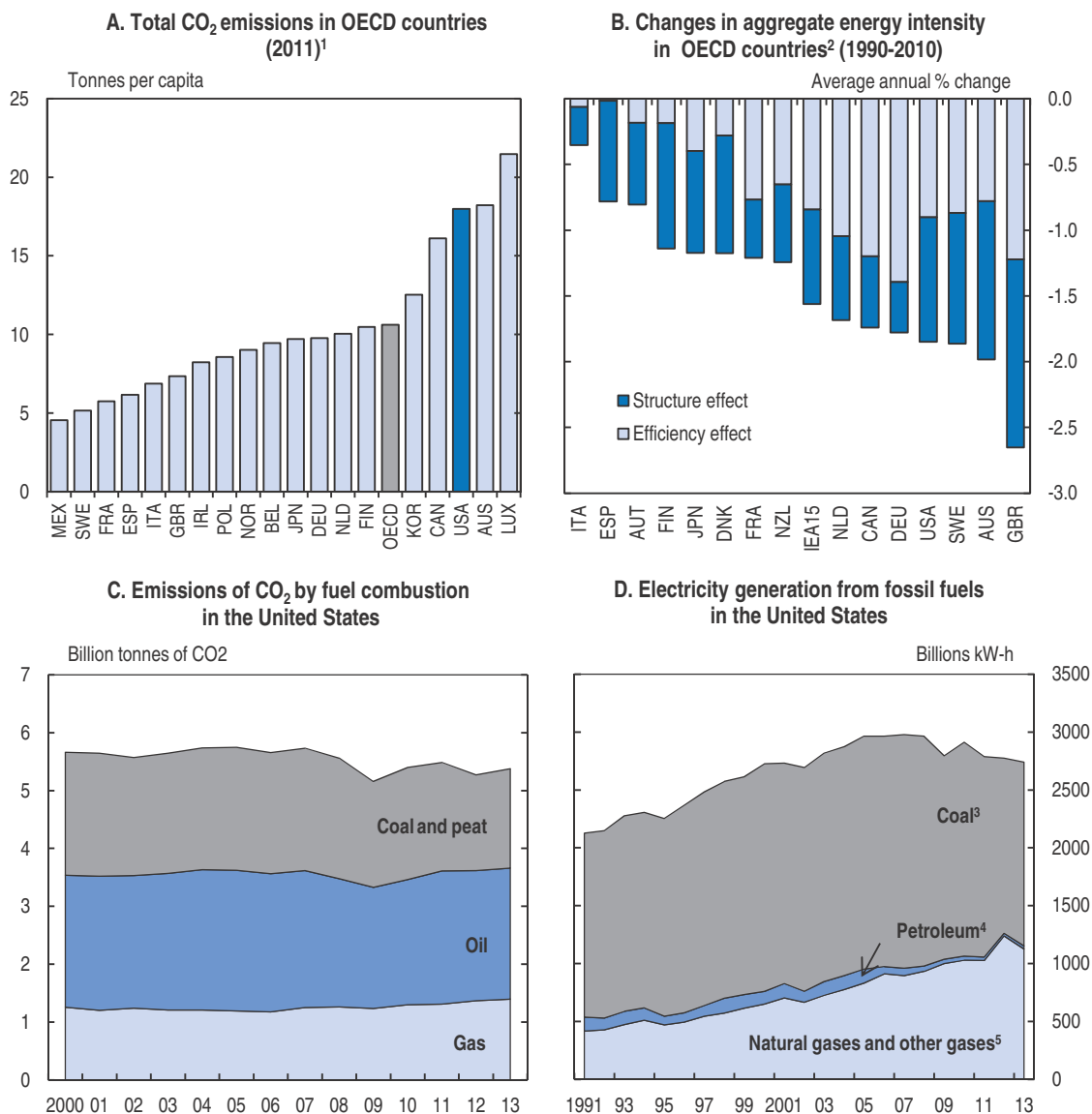
Hydraulic fracturing poses potential risks to water resources, although the environmental consequences are not completely understood. Up to 5 million gallons of water are needed for each shale gas hydraulic fracturing well. This demand in a relatively short period puts stress on local water resources. Pricing water resources effectively and allowing trading may go some way to ensuring limited water resources are used efficiently. Shallow freshwater aquifer contamination and surface water contamination are also potential risks. Preliminary findings suggest that people living near hydraulic fracturing sites face groundwater contamination risk, which reduces the values of their homes (Muehlenbachs et al., 2012). Some of the water introduced in hydraulic fracturing wells will become “flowback”, which needs to be disposed of and treated due to the chemicals added to the hydraulic fracturing fluids. Some states have not required the disclosure of what chemicals are being used in fracturing fluids (McFeeley, 2012). However, other states have begun to require industry participants to report which chemicals are being used. Voluntary reporting of chemicals has also emerged and the EPA is seeking public comments on disclosure. While exemptions to public disclosure due to trade secrets can be part of the disclosure regime, companies should still be required to report the chemicals being used to a regulatory authority.

Regulation on water use and the protection of groundwater and surface waters has originated at different levels of governments, which has resulted in a complex overall regulatory regime. For example, local authorities, groundwater management areas and regional planning bodies are involved in granting access to water resources, and state and federal bodies are responsible for environmental management and stewardship. Most regulation of hydraulic fracturing is issued at the state level, although the Department of Interior can regulate hydraulic fracturing on federal land, and EPA has some limited responsibility under the Clean Water Act and Safe Drinking Water Act. Further study is needed to formulate regulation to address environmental concerns and increase public confidence in hydraulic fracturing, notably to harmonise and strengthen the impact assessments of drilling projects.

The climate change perspective

In 2009, the United States announced a goal of reducing greenhouse gas emissions in the range of 17% from 2005 levels by 2020. There have been sizeable reductions in emissions as well as improvements in energy efficiency (Figure 20). The current approach to meet climate change objectives at the federal level relies less on using market-based instruments, such as a carbon tax, and more on regulation. In this context, the EPA is charged with regulating greenhouse gas emissions from electricity generation under the Clean Air Act. Initiatives to improve energy efficiency reduce emissions further. This approach to emission abatement, which also gives states flexibility in how to implement policy, likely can be more costly than a market mechanism (as was found for the successful sulphur emissions reduction programme, which used a cap-and-trade approach). Nevertheless, by inducing fuel switching, regulation

Figure 20. **Some progress in reducing greenhouse gas emissions**



1. 2010 for Mexico.
 2. For the United States, data are mainly compiled and estimated by the IEA based on available sources including IEA energy balances, US Energy Information Administration, US Bureau of Transportation Statistics, Oak Ridge National Laboratory, OECD STAN Database, US Census Bureau and Pacific Northwest National Laboratory.
 3. Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal synfuel.
 4. Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.
 5. Natural gas, plus a small amount of supplemental gaseous fuels. Other gases: Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

Source: International Energy Agency and US Energy Information Administration.

StatLink <http://dx.doi.org/10.1787/888933081302>

may achieve some reductions at relatively low cost (Goulder et al., 2014). When adopting this approach, care is needed to prevent the marginal abatement costs from different emission sources from diverging too much (which would raise total costs). The States will have flexibility to meet the new greenhouse gas power plant rules, thereby allowing them to choose locally-appropriate compliance methods.

The rapid development of US shale gas resources has helped to reduce emissions by substituting natural gas for coal (Figure 20). More natural gas turbines would reduce, but not eliminate, the intermittency problem associated with some renewable energy sources, facilitating the expansion of renewable generation. Low natural gas prices could also reduce emissions from the transport sector to the extent that natural gas-powered vehicles are used more.

Fugitive methane emissions from hydraulic fracturing create a global environmental concern. More work remains to quantify the scale of these emissions and at what points in production and transportation they occur. More is known about production than distribution (IEA, 2012; Allen et al., 2013). From a climate-change perspective, these emissions could significantly reduce the attractiveness of natural gas as an energy source, although they are unlikely to be large enough to offset the long-term benefits of replacing coal (Brandt et al., 2014). EPA guidance was to flare these emissions, as this reduces the potency of the emissions, but following amendments to air regulations for the oil and gas industry in 2012 companies are encouraged to move towards “green completion” of wells, which separates gas and liquids flowing from the well and captures the gas. The second phase of the amendments starting in 2015 requires companies to capture the gas and make it available for use or sale. A number of states and local governments have already moved to address these issues. For example, Colorado, in collaboration with industry, has established regulations on reducing methane emissions. In other cases, states have considered using taxes to make fugitive methane emissions more costly.

The substitution of natural gas for coal has had repercussions on the market for coal. Despite declining domestic demand, US coal production has fallen only slightly as coal exports have more than doubled since the shale gas boom took hold in 2007. Pricing the carbon content of fuels, such as with an emission tax, both in the United States and other countries, would ensure that the environmental benefits of switching to natural gas in one country are not lost through increasing coal consumption in other countries.

An energy mix focusing on the combination of natural gas and renewables in electricity generation will go a long way towards providing reliable supply while lowering the US greenhouse gas emissions. This might happen because electricity production from natural gas would help meet demand when generation from wind and solar electricity drops due to changes in wind and sunlight. Additional investment will be needed to ensure that the grids can cope with large variations in renewable supply. The impressive gains in energy efficiency were partly driven by innovation in energy-saving technology induced by high energy prices (Popp, 2002). To achieve further emission reductions in the absence of an emission tax, some subsidisation of innovation in energy saving technology and support of renewables is warranted (Aghion et al., 2012). At the federal level, the Administration proposed to create an Energy Security Trust Fund, which would also work in this direction. At the state level, Renewable Portfolio Standards, which 30 states already use, act in this direction. However, altering programmes that supports renewable energy generation in inefficient locations and impose high costs on electricity system operators should be re-examined (Schmalensee, 2013).

The development of shale gas can support the transition towards a lower carbon economy. Relatively low natural gas prices have already encouraged fuel substitution towards less carbon-intensive energy production and provide a platform on which to build. However, in the absence of concerted action to manage the transition there is a danger that, as relative prices change or in the longer run as natural gas begins to be depleted, the energy market will respond by switching back to coal-fired power. In this context, while the

shale gas boom could provide the “bridge fuel” towards a lower carbon economy, flanking measures (emission pricing, subsidising innovation, supporting renewables and developing smart electricity grids) will be required to ensure this outcome materialises.

Capturing the benefits

The boom in oil and gas production is having significant effects in the states where the deposits are located. This raises two related questions: who captures the benefits of the boom and what happens after the oil and gas deposits are exhausted? The challenge is to ensure that current resource use also supports economic welfare in the future. On aggregate for the United States, estimates of adjusted net savings, which take into account whether total wealth, notably including natural resources, is increasing, suggest that investment in education outweighs the depletion of natural resources (World Bank, 2006; see also Brandt et al., 2013). By capturing some of the resource rent, governments can address the needed adjustment once the resource boom has run its course. This could take the form of investing in education to help workers become more adaptable, financing productive infrastructure, establishing endowment funds or putting government finances on a better footing by paying down debt. In some senses, due to the fungibility of money, ensuring that policymakers avoid squandering the revenues is key to securing longer-term welfare.

Federal and state governments may capture some of the resource rent through various taxes and use the revenues to support spending or funds that will raise future well-being. Taxing natural resource rents, if done properly, can be less distortionary than other forms of taxation (Box 3). However, most governments rely on royalties and the rate applied can be relatively low. Nonetheless, a few states have experienced a significant increase in revenues from resource related taxation (Table 2) and have also boosted spending (NASBO, 2013). For deposits on federal lands, the Government Accountability Office (GAO, 2013) has recommended increasing the share of revenue collected from the extraction of federal oil and gas resources. On both federal and some state land, oil and gas producers are required to pay restoration fees or post bonds to address the environmental consequences of drilling.

Box 3. Taxation of non-renewable natural resources

Taxing the extraction of non-renewable resources offers the potential to raise revenue in a relatively non-distortionary way. However, the form of taxation is important. In the United States, most governments rely on royalties (also known as severance taxes).

Royalty taxes are based on the amount of oil and gas extracted. While relatively easy to collect they introduce a number of distortions. The tax can induce the firm to shut down production prematurely, and can reduce incentives to invest in exploration, although this can be mitigated by offering investment subsidies. Profit taxation, which has been implemented in Alaska, is intended to capture a share of profits arising from the resource rent. This form of taxation can potentially capture a large share of the resource rent without distorting investment and production decisions. With this approach, a tax is levied on all real transactions on a cash flow basis. The government reimburses the firm for negative cash flows, which are typical in the early stage of a project, and retain a share of total revenue when the project is generating a positive cash flow. In practice, governments find it hard to compensate a private sector firm contemporaneously and prefer to allow the private company to carry forward losses with interest. Furthermore, the tax base can differ from the resource rent, which will introduce distortions to investment and production decisions, though they are less severe than under royalty tax regimes.

Table 2. Tax revenue from oil and gas
Selected states with significant shale gas production

	Taxes on production as % of state GDP		Taxes on production as % of value added	All royalty taxes as % of state GDP	
	2007	2011	2011	2007	2011
Alabama	0.1	0.1	17.4	0.1	0.1
Alaska	7.1	10.4	58.1	5.5	11.2
Arkansas	0.0	0.1	7.0	0.0	0.1
California	0.1	0.1	11.8	0.0	0.0
Colorado	0.4	0.5	20.9	0.1	0.1
Kentucky	0.0	0.0	41.9	0.2	0.2
Louisiana	0.7	0.7	8.7	0.4	0.4
Michigan	0.0	0.0	27.1	0.0	0.0
Montana	0.2	0.2	26.4	0.8	0.8
New Mexico	1.6	1.4	27.9	1.3	1.0
North Dakota	0.3	0.4	16.5	1.4	6.9
Ohio	0.1	0.0	30.3	0.0	0.0
Oklahoma	1.3	1.2	17.0	0.7	0.5
Pennsylvania	0.0	0.1	15.3	0.0	0.0
Texas	1.2	1.1	16.1	0.2	0.3
West Virginia	0.3	0.2	25.3	0.6	0.9
Wyoming	3.2	3.2	23.7	2.4	2.5

Note: Royalty taxes are all royalty revenues, not just those accruing from oil and gas mining.

Source: BEA, Census bureau.

Recommendations for managing new energy resources

Hydraulic fracturing

- Study the environmental impacts of hydraulic fracturing and develop regulations to address any negative impacts including, if necessary, legislative action to harmonise regulation across states and strengthen *ex ante* environmental impact assessments for drilling projects.
- Invest in skills and infrastructure using receipts from profit taxes levied on oil and gas production.

Climate change

- Further lower emissions with efficient policy tools as part of the climate-change strategy, notably by putting a price on greenhouse gas emissions, though well-designed regulation and investment in renewables also have a role to play.
- Promote innovation in energy saving and low carbon technology.

Further recommendations

- Ensure that trade restrictions do not hamper energy exports.
- Study the problem of fugitive methane emissions, and develop regulations to address any negative impacts.
- Promote investment in infrastructure for energy transportation, taking into account safety concerns.

Bibliography

- Aghion, P. et al. (2012), “Carbon Taxes, Path Dependency and Directed Technical Change: Evidence from the Auto Industry”, *NBER Working Paper*, No. 18596.
- Allen, D. et al. (2013), “Measurement of Methane Emissions at Natural Gas Production Sites in the United States”, *Proceedings of the National Academy of Sciences*.
- Altig, D. et al. (2001), “Simulating Fundamental Tax Reform in the United States”, *American Economic Review*, Vol. 91, No. 3, pp. 574-595.
- Appelbaum, E. and R. Milkman (2011), “Leaves that Pay: Employer and Worker Experiences with Paid Family Leave in California”, mimeo.
- Arnold, J. et al. (2011), “Tax Policy for Economic Recovery and Growth”, *The Economic Journal*, Vol. 121, pp. 59-80.
- Arrow, K. et al. (2012), “Sustainability and the Measurement of Wealth”, *Environment and Development Economics*, Vol. 17, pp. 317-353.
- Auerbach, A. (2006), “Tax Reform in the 21st Century”, *Berkeley Olin Program in Law and Economics Working Paper Series*.
- Autor, D. (2011), “The Unsustainable Rise of Disability Rolls in the United States: Causes, Consequences, and Policy Options”, *NBER Working Paper*, No. 17697.
- Barnay, T. (2014), “Health, Work and Working Conditions; A Review of the European Economic Literature”, *OECD Working Paper*, OECD Publishing, Paris, forthcoming.
- Brandt, A. et al. (2014), “Methane Leaks from North American Natural Gas Systems”, *Science*, Vol. 343, No. 6172, pp. 733-735.
- Brandt, N., P. Schreyer and V. Zipperer (2013), “Productivity Measurement with Natural Capital”, *OECD Economics Department Working Papers*, No. 1092, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5k3xnhsz0vtg-en>.
- Caldera Sánchez, A. and C. Tassot (2014) “An Exploration of the Determinants of the Subjective Wellbeing of Americans during the Great Recession”, *OECD Working Paper*, OECD Publishing, Paris, forthcoming.
- Calvo, G.A., L. Leiderman and C.M. Reinhart (1996), “Inflows of Capital to Developing Countries in the 1990s”, *Journal of Economic Perspectives*, Vol. 10(2), American Economic Association, pp. 123-139, Spring.
- Carey, D., B. Herring and P. Lenain (2009), “Health Care Reform in the United States”, *OECD Economics Department Working Papers*, No. 665, OECD Publishing, Paris, <http://dx.doi.org/10.1787/227104360465>.
- Cauthen, N. (2013), *Scheduling Hourly Workers: How Last Minute, “Just-In-Time”, Scheduling Practices Are Bad for Workers, Families and Business*, Demos, New York.
- Celasun, O. et al. (2014), “The US Manufacturing Recovery: Uptick or Renaissance?”, *IMF Working Paper*, No. WP/14/28.
- Center for Regional Economic Competitiveness (2014), *State Economic Development Program Expenditures Database*, mimeo.
- CBO (2010), *Fannie Mae, Freddie Mac, and the Federal Role in the Secondary Mortgage Market*, Washington, DC.
- CBO (2013a), *The Distribution of Major Tax Expenditures in the Individual Income Tax System*, Washington, DC.
- CBO (2013b), *The Distribution of Household Income and Federal Taxes*, Washington, DC.
- CBO (2014a), *An Analysis of the President’s 2015 Budget*, Washington, DC.
- CBO (2014b), *Updated Budget Projections: 2014 to 2024*, Washington, DC.
- CBO (2014c), *The Effects of a Minimum-Wage Increase on Employment and Family Income*, Washington, DC.
- CEA (2014), *Economic Report of the President*, Council of Economic Advisors, Washington, DC.
- Darden, M. (2014), “Workplace Stress and Policy in the United States: Issues and Policies”, *OECD Working Paper*, OECD Publishing, Paris, forthcoming.
- Dembe, A., R. Delbos and J. Erickson (2008), “The Effect of Occupation and Industry on the Injury Risks from Demanding Work Schedules”, *Journal of Occupational and Environmental Medicine*, Vol. 50(10), p. 1185.

- Doucouliaagos, H. and T. Stanley (2009), "Publication Selection Bias in Minimum-Wage Research? A Meta-Regression Analysis", *British Journal of Industrial Relations*, Vol. 47, No. 2, pp. 406-428.
- Dube, A., T. Lester and M. Reich (2010), "Minimum Wage Effects Across State Borders: Estimates Using Contiguous Counties", *Review of Economics and Statistics*, Vol. 92, No. 4, pp. 945-964.
- Dunn, W. (2013), "The US Labour Market Recovery Following the Great Recession", *OECD Economics Department Working Papers*, No. 1015, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5k4ddxp3xlvf-en>.
- EIA (2013), *Annual Energy Outlook 2013*, US Energy Information Administration, Washington, DC.
- Federal Reserve (2014), *Monetary Policy Report*, Federal Reserve Board of Governors, Washington, DC.
- Förster, M. and M. Pearson (2002), "Income Distribution and Poverty in the OECD Area: Trends and Driving Forces", *OECD Economic Studies*, Vol. 2002/1, OECD Publishing, Paris, http://dx.doi.org/10.1787/eco_studies-v2002-art2-en.
- GAO (2013), "Oil and Gas Resources: Actions Needed for Interior to Better Ensure a Fair Return", *Report to the Chairman, Committee on Energy and Natural Resources, US Senate*, GAO-14-50.
- Gilboa, S. et al. (2008), "A Meta-Analysis of Work Demand Stressors and Job Performance: Examining Main and Moderating Effects", *Personnel Psychology*, Vol. 61, pp. 227-281.
- Goetzel et al. (2004), "Health, Absence, Disability, and Presenteeism Cost Estimates of Certain Physical and Mental Health Conditions Affecting US Employers", *Journal of Occupation and Environmental Medicine*, pp. 398-412, www.ncbi.nlm.nih.gov/pubmed/15076658.
- Goldin, C. (2014), "A Grand Gender Convergence: Its Last Chapter", *American Economic Review*, forthcoming.
- Goolsbee, A. (2006), "The 'Simple Return': Reducing America's Tax Burden through Return-free Filing", *The Hamilton Project Discussion Paper*, No. 2004-04.
- Gordon, R. (2014), "The Demise of US Economic Growth: Restatement, Rebuttal, and Reflections", *NBER Working Paper*, No. 19895.
- Goulder, L., M. Hafstead and R. Williams (2014), "General Equilibrium Impacts of a Federal Clean Energy Standard", *NBER Working Paper*, No. 19847.
- Hall, R. (2014), "Quantifying the Last Harm to the US Economy from the Financial Crisis", mimeo.
- Heckman, J. (2009), "The Case for Investing in Disadvantaged Young Children", *Big Ideas for Children: Investing in Our Nation's Future*, Washington: First Focus, pp. 49.
- Heckman, J. (2013), *Giving Kids a Fair Chance*, Boston Review Books, Cambridge.
- Holtz-Eakin (2013), "Workplace Policy Toward Overtime Workers", *American Action Forum*.
- Houser, L. and T. Vartanian (2012), *Policy Matters: Public Policy, Paid Leave for New Parents, and Economic Security for US Workers*, Center for Women and Work at Rutgers, The State University of New Jersey.
- IEA (2012), *Golden Rules for a Golden Age of Gas: World Energy Outlook Special Report on Unconventional Gas*, OECD Publishing, Paris, www.worldenergyoutlook.org.
- Kaminsky, G. and C. Reinhart, (1999), "The Twin Crises: the Causes of Banking and Balance-of-Payments Problems", *American Economic Review*, Vol. 89, pp. 473-500.
- Krueger, A., J. Cramer and D. Cho (2014), "Are the Long-Term Unemployed on the Margins of the Labor Market?", *Brookings Papers on Economic Activity*, forthcoming.
- McFeeley, M. (2012), "State Hydraulic Fracturing Disclosure Rules and Enforcement", *NDRC Issues Brief*, July 2012.
- Muehlenbachs, L., E. Spiller and C. Timmins (2012), "Shale Gas Development and Property Values: Differences across Drinking Water Sources", *NBER Working Paper*, No. 18390.
- NASBO (2013), *The Fiscal Survey of States: Fall 2013*, National Association of State Budget Officials, Washington, DC.
- National Governors Association (2014), "America Works: Education and Training for Tomorrow's Jobs", National Governors Association, Washington, DC.
- OECD (2008), *OECD Economic Surveys: United States 2008*, OECD Publishing, Paris, http://dx.doi.org/10.1787/eco_surveys-usa-2008-en.
- OECD (2010), *Sickness, Disability and Work: Breaking the Barriers – A Synthesis of Findings across OECD Countries*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264088856-en>.

- OECD (2011), "Housing and the Economy: Policies for Renovation", *Economic Policy Reforms 2011: Going for Growth*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/growth-2011-46-en>.
- OECD (2012), *OECD Economic Surveys: United States 2012*, OECD Publishing, Paris, http://dx.doi.org/10.1787/eco_surveys-usa-2012-en.
- OECD (2013a), *Time for the U.S. to Reskill? What the Survey of Adult Skills Says*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264204904-en>.
- OECD (2013b), *How's Life? 2013: Measuring Well-being*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264201392-en>.
- OECD (2014a), *Tackling High Inequalities: Creating Opportunities for All*, OECD Publishing, Paris, forthcoming.
- OECD (2014b), *Mental Health and Work: Switzerland*, Mental Health and Work, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264204973-en>.
- OECD (2014c), "Growth Prospects and Fiscal Requirements over the Long Term", *OECD Economic Outlook*, Vol. 2014/1, OECD Publishing, Paris, http://dx.doi.org/10.1787/eco_outlook-v2014-1-en.
- Olaberria, E. (2014), *How Threatening is the "Taper Wolf" for Emerging Markets?*, OECD Publishing, Paris.
- Ollivaud, P., E. Rusticelli and C. Schweltnus (2014), "Would a Growth Slowdown in Emerging Markets Spill Over to High-Income Countries? A Quantitative Assessment", *OECD Economics Department Working Papers*, No. 1110, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5jz5m89p82d8-en>.
- Pew Research Center (2013), *Modern Parenting – Roles of Moms and Dads Converge as They Balance Work and Family*, Pew Research Center.
- Popp, D. (2002), "Induced Innovation and Energy Prices", *American Economic Review*, Vol. 92, No. 1, pp. 160-180.
- Rawdanowicz, L., R. Bouis, J. Brezillon, A. Christensen and K.I. Inaba (2014), "Spillover Effects from Exiting Highly Expansionary Monetary Policies", *OECD Economics Department Working Papers*, No. 1116, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5jz417mb6dzp-en>.
- Reifschneider, D., W. Wascher and D. Wilcox, (2013), "Aggregate Supply in the United States: Recent Developments and Implications for the Conduct of Monetary Policy", *Finance and Economics Discussion Series 2013-77*, Board of Governors of the Federal Reserve System (US).
- Rothstein, J. (2010), "Is the EITC as Good as an NIT? Conditional Cash Transfers and Tax Incidence", *American Economic Journal: Economic Policy*, Vol. 2, No. 1, pp. 177-208.
- Schmalensee, R. (2013), "The Performance of US Wind and Solar Generating Units", *NBER Working Paper*, No. 19509.
- Shriver, M. (2014), "The Shriver Report: A Woman's Nation Pushes back from the Brink", Center for American Progress.
- Stevenson, B. and J. Wolfers (2008), "Economic Growth and Subjective Well-Being: Reassessing the Easterlin Paradox", *Brookings Papers on Economic Activity*, Vol. 39, Spring, pp. 1-102.
- Stevenson, B. and J. Wolfers (2013), "Subjective Well-Being and Income: Is There Any Evidence of Satiation?", *American Economic Review*, Vol. 103(3), American Economic Association, pp. 598-604, May.
- Thévenon, O. and A. Solaz (2013), "Labour Market Effects of Parental Leave Policies in OECD Countries", *OECD Social, Employment and Migration Working Papers*, No. 141, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5k8xb6hw1wjf-en>.
- Ton, Z. (2013), *The Good Jobs Strategy: How the Smartest Companies Invest in Employees to Lower Costs and Boost Profits*, New Harvest.
- Ueda, K. and B. Weder di Mauro (2012), "Quantifying Structural Subsidy Values for Systemically Important Financial Institutions", *IMF Working Paper*, No. 12/128.
- Wilkinson, J., K. Spong and J. Christensson (2010), "Financial Stability Reports: How Useful During a Financial Crisis?", *Economic Review First Quarter 2010*, Federal Reserve Bank of Kansas city.
- Wolfson, P. and D. Belman (2014), *What Does the Minimum Wage Do?* Upjohn Institute for Employment Research, Kalamazoo, MI.
- World Bank (2006), *Where Is the Wealth of Nations? Measuring Capital for the 21st Century*, Washington, DC.

ANNEX

Follow-up to previous OECD policy recommendations

This annex reviews action taken on recommendations from previous Surveys. They cover the following areas: macroeconomic policy priorities, structural policy priorities and health policy priorities. Each recommendation is followed by a note of actions taken since the June 2012 Survey. Recommendations that are new in this Survey are listed in the relevant chapter.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

This annex presents, under each theme:

- Recommendations from earlier surveys
 - ❖ **Action taken since the previous Survey (2012)**

Labour markets

- The Earned Income Tax Credit (EITC) should be increased.
 - ❖ **Temporary expansions of the EITC were extended through December 2017 by the American Taxpayer Relief Act of 2012.**
- Implement strategies to increase employment of the disabled.
 - ❖ **The Disability Employment Initiative (DEI) seeks to improve education, training, and employment opportunities and outcomes of youth and adults who are unemployed, underemployed, and/or receiving Social Security disability benefits. The DEI is jointly funded and administered by the US Department of Labor's Employment and Training Administration and the Office of Disability Employment Policy. Since 2010, the Department of Labor has awarded over USD 81 million in grants to 26 states through the initiative.**
- Provide additional support for job training and education for unemployed workers whose skills have deteriorated.
 - ❖ **In April 2013 the Department of Labor announced the availability of USD 474.5 million to create and expand innovative partnerships between community colleges and businesses to educate and train workers with the skills employers need. This third round of funding since 2009 under the Trade Adjustment Assistance Community College and Career Training grants programme brings total investments to nearly USD 1.5 billion.**
- Monitor whether guidelines for labour market programmes are being followed.
 - ❖ **No action.**
- Return the duration of unemployment benefits to pre-recession levels as the labour market improves.
 - ❖ **The weeks of available unemployment benefits gradually fell in 2012 and the programme allowing states to provide extended benefits expired altogether at the end of 2013.**
- Develop enhanced "activation" programmes to facilitate the return to work for unemployed individuals.
 - ❖ **In 2014 USD 150 million was allocated to the "Ready to Work" Partnerships that support public-private efforts to put the long-term unemployed back to work.**

Education

- Greatly raise limits on Stafford loans, especially for unsubsidised direct loans, so that they cover the full cost of study. The interest rate on these loans should vary with the long-term bond rate. The default repayment plan should be income-contingent.
 - ❖ **In August 2013 the Bipartisan Student Loan Certainty Act re-established interest rates for new Federal Direct Student Loans. Interest rates at origination are tied to the 10-year Treasury note, plus a margin, but are fixed for the life of the loan. For loans made between 1 July 2013 and 30 June 2014, the interest rate**

was 3.86% for undergraduates, 5.41% for graduate students, and 6.41% for PLUS loans. The bill also imposes a cap to ensure interest rates never exceed 8.25% for undergraduate students, 9.5% for graduate students, and 10.5% for PLUS borrowers.

- Simplify or abolish tax preferences for higher education expenses.
 - ❖ **No action.**

Health care

- Reform the individual and small-group market to facilitate greater risk pooling. To this end, require community-rated and guaranteed issue policies and make health insurance compulsory. Introduce means-tested subsidies to help low-income persons afford health insurance.
 - ❖ **These were key features of the Affordable Care Act of 2010.**
- Replace the health tax exclusion (i.e. the exclusion from taxable personal income and payroll tax of compensation paid in the form of health insurance cover) with more efficient subsidies that are independent of the health plan (subject to minimum standards of coverage being satisfied).
 - ❖ **The Affordable Care Act includes an excise tax that will be levied on high cost health insurance plans starting in 2018.**
- Roll out Medicare provider-payment reforms that prove to be successful in pilot tests across the programme, as planned.
 - ❖ **Pilots are underway, but none have yet been expanded programme-wide.**
- Enhance the dissemination of information on the effectiveness and cost of treatments and procedures.
 - ❖ **ARRA and the Affordable Care Act included funding for comparative effectiveness research (which compares the efficacy of treatments). The Patient Centered Outcome Research Institute has been created to carry out such research.**
- Gradually lower Medicare Advantage payments to the level of traditional fee-for-service Medicare plans.
 - ❖ **The Affordable Care Act lowers excess payments for Medicare Advantage plans.**
- Decrease the generosity of supplemental Medicare insurance designs for beneficiaries without chronic conditions to reduce moral hazard risks.
 - ❖ **No action.**
- Ensure that prescription drug benefits do not jeopardise Medicare's long-run solvency.
 - ❖ **The comparative effectiveness pilot study provided for in the Affordable Care Act could reduce pharmaceutical costs if successful and rolled out nationally by helping to determine the prices to pay for new drugs.**
- Do not delay further the use of competitive tenders for Medicare purchases of medical equipment and supplies.
 - ❖ **Competitive bidding for purchase of durable medical equipment is phasing in nationwide.**

Ageing

- Speed up the phased increase in the official retirement age (at which full social security benefits are paid) from 65 to 67. Link the retirement age to active life expectancy thereafter such that the ratio of the expected duration of active retirement to working life remains constant.
 - ❖ **No action.**
- Reduce the replacement rate for higher earners and raise the Social Security tax cap.
 - ❖ **No action.**

Product markets

- Improve energy infrastructure, in particular electricity transmission.
 - ❖ **The electricity network is being upgraded, in particular to facilitate the use of renewable electricity, with funds from ARRA.**
- Roll back extra support given to farmers in recent years.
 - ❖ **The Agricultural Act of 2014 ended direct cash payments to farmers and moved toward a more market-oriented approach focused on crop insurance.**

Financial markets

- Subject systematically important financial institutions to strict and conservative prudential standards. These institutions should hold capital against off-balance sheet risks and be subject to counter-cyclical capital requirements.
 - ❖ **In April 2014 the Board of Governors of the Federal Reserve System, the Office of the Comptroller of the Currency, and the Federal Deposit Insurance Corporation adopted a final rule for supplementary leverage ratio standards applicable to the largest US banking organisations (the Final Rule). The Final Rule adopts as largely unchanged the supplementary leverage ratio standards proposed by the Agencies in 2013 (3% of common equity Tier 1 capital, plus a greater-than 2% surcharge for affected bank holding companies and a greater-than 3% surcharge for their depository institution subsidiaries).**
- Leave the securitisation of mortgages to the private sector. This would entail privatising the Government Sponsored Enterprises, cutting off their access to preferential lending facilities with the federal government, subjecting them to the same regulation and supervision as other issuers of mortgage-backed securities, and dividing these entities into smaller companies that are not too big to fail.
 - ❖ **Fannie Mae and Freddie Mac remain under government stewardship. The Senate Banking Committee passed in May 2014 a bipartisan proposal (“Johnson-Crapo GSE reform”) seeking to reform the housing finance system, create greater competition and reduce taxpayer risk, while ensuring affordable, fair access to all creditworthy homebuyers.**
- Reduce impediments to voluntary mortgage restructuring.
 - ❖ **The various programmes to encourage mortgage restructuring that were first initiated (HARP, HAMP) had disappointing take-up rates, reflecting complicated procedures and restrictive eligibility requirements. HARP 2.0 was initiated in late 2011 and subsequent changes were made throughout 2012 and 2013. As a result of the modifications HARP refinance volume has increased.**

Taxation

- Reduce deductions for mortgage interest and state and local income tax.
 - ❖ **The Administration has proposed in the FY 2015 budget to reduce the rate at which high-income earners (married couples with incomes of over USD 250 000 per year and singles with incomes exceeding USD 200 000 per year) can claim tax deductions or exclusions to 28%.**
- Increase reliance on consumption taxation.
 - ❖ **No action.**

Environment

- Implement comprehensive pricing of Greenhouse Gas (GHG) emissions.
 - ❖ **No action has been taken.**
- Support multilateral actions to strengthen emissions monitoring in developing countries and work with other countries to ensure that a large supply of genuine offsets is available. Work with other countries to harmonise cap-and-trade programmes so that they can eventually be linked.
 - ❖ **The United States Agency for International Development (USAID) developed Enhancing Capacity for Low Emission Development Strategies (EC-LEDS), a programme to collaborate with partner countries to estimate GHG emissions and identify and implement the best options for low emission growth. Partnerships with over 20 developing countries have been forged under EC-LEDS.**
 - ❖ **The United States Environmental Protection Agency (EPA) developed the Greenhouse Gas Inventory Capacity Building Program. EPA works in collaboration with the United Nations Framework Convention on Climate Change (UNFCCC) and USAID to help developing countries improve their capacity to estimate and track their GHG emissions through sustainable inventory management systems.**
- In the event that it is not possible to pass legislation pricing GHG emissions, reduce emissions using the next most cost-effective instruments available, such as energy taxes and regulation.
 - ❖ **The United States Environmental Protection Agency (EPA) has introduced regulations requiring new vehicles to meet higher fuel economy standards. The EPA has proposed rules to limit carbon dioxide emissions from new and existing power stations under carbon pollution standards (2013) and The Clean Power Plan (2014).**

Mortgage loans

- Simplify procedures and expand eligibility for mortgage loan programmes.
 - ❖ **FHFA implemented the new Streamlined Modification Initiative in July 2013. The initiative increased eligibility to severely delinquent borrowers and simplified required documentation. The programme is due to expire in December 2015.**

Innovation

- Reductions in the federal R&D budget should be as limited as possible.
 - ❖ **The Administration has proposed increases in Federal support of R&D, most recently in the 2015 Budget proposal of USD 135.4 billion, a nominal increase of 1.2% over 2014. In addition, there is a supplementary 2015 proposal of USD 5.3 billion for R&D related to “Opportunity, Growth, and Security”. Recently, the US government approved USD 133.7 billion for Federal R&D in 2014, a 2.6% increase over 2013.**
- Improve quality secondary education to better prepare students for STEM tertiary studies.
 - ❖ **The US is taking policy actions to improve quality secondary education, based on the recommendations of the President’s Council of Advisors on Science and Technology (PCAST) 2010 report Prepare and Inspire, including: supporting state-led standards for secondary education; making investments toward the goal of preparing 100 000 more STEM-qualified teachers over the next decade; and initiating a STEM Master Teacher Corps.**

Thematic chapters

Chapter 1

Improving well-being

Life is quite good in the United States compared to other OECD countries, thanks to strong economic growth and technological progress having lifted average income to high levels. Nonetheless, there is evidence to suggest that the benefits from these gains have not been sufficiently broad based. Self-reported happiness increases with income, an issue particularly resonant in a country with among the highest levels of income inequality in the OECD and a pattern of inequality that appears to be moving toward even more concentration at the very top at the expense of the middle class and the poor. Working hours that remain among the longest in the OECD are also creating challenges for work-life balances, child education, personal care and leisure. These pressures are contributing to higher job strain and work-related stress with unhealthy consequences, including for mental health, and a detrimental impact on employability and medical costs. While these trends cannot be easily reversed, a number of policy options are being usefully rolled out and other initiatives are being considered: federal-level policies improving access to health care and early-childhood education, state-level initiatives favouring workplace flexibility, firm-level investments in job quality and greater attention to the health consequences of job-stress. If successfully adopted, they would go a long way toward improving the well-being of American working families.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

The United States enjoys an enviable economic performance by international standards, with high per capita GDP contributing to a good life for many Americans (Sacks et al., 2012; Stevenson and Wolfers, 2013). This is not a surprise, given the US lead over the past century in productivity and innovation. However, concerns about the limitations of economic indicators as gauges of good lives have been expressed over many years (Box 1.1), including by Robert F. Kennedy in 1968 with his critique of GDP as a measure of society's progress (Landefeld et al., 2010) and more recently by President Obama in his inaugural address in 2009 (White House, 2009). Indeed, in non-economic dimensions that are important to well-being – such as social cohesion, job quality, family time, communities and the natural environment – the United States performs less well than some other OECD countries and the perception of well-being varies across population groups (Figure 1.1).

A particularly notable feature of Figure 1.1 is how the incidence of self-reported happiness tends to increase with income. In terms of how broad a base of well-being there is in the United States, it is pertinent to consider levels and trends in income inequality.

Figure 1.1 also shows starkly that typical families face more challenges in the United States than in other countries to achieve satisfactory work-life balances, owing to longer working long hours, with a negative impact on work-related stress and time available for personal care and the education of children.

While the sources of inequality and stagnation of middle-class real incomes are being hotly debated, far less analysis has been devoted in the United States to work-life conflicts, despite the importance of this dimension. This chapter fills this gap with a discussion of poor work-life balances and the consequences for the well-being of families and for the health of workers. The chapter pays particular attention to policy initiatives currently implemented and being considered to improve the well-being of families. The first section identifies what explains the rising pressures on work-life balance faced by families. The second section discusses the negative health impact of these pressures and, more generally, of adverse working conditions. The third section notes that work-life conflicts are often associated to the poor quality of jobs and that improving job quality would a long way towards improving the well-being of families, without harming the performance of businesses. The fourth section notes that the working poor are often employed part time; although they face less working-time pressure, their well-being is negatively affected by the lack of income. The fifth section discusses initiatives at the firm level and state level to provide more generous family paid leave and make workplaces more flexible. Finally, the last section looks into the consequences of these trends for the future well-being of children and emphasizes the role of early education and childcare.

Box 1.1. **Beyond GDP**

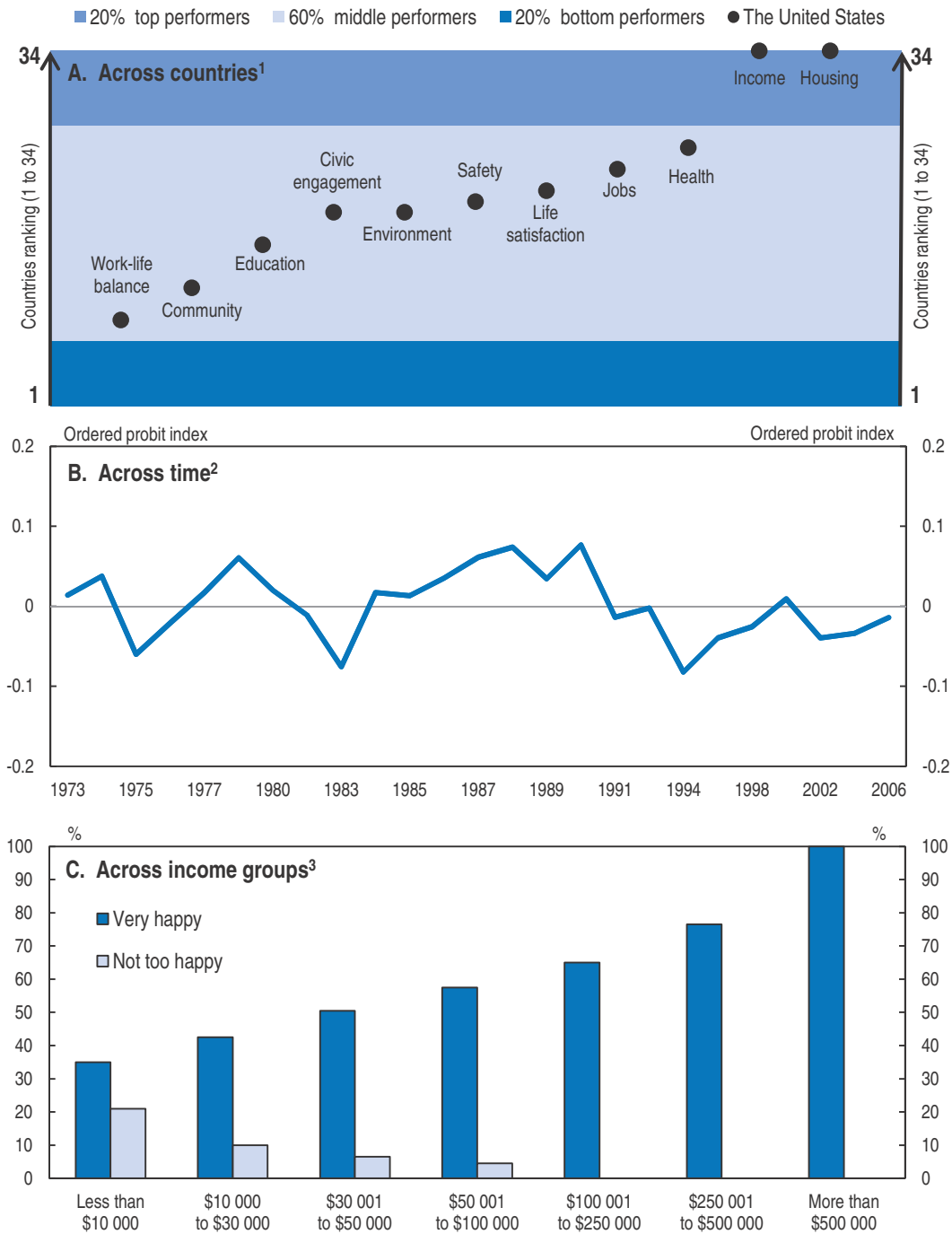
Scepticism about the usefulness of GDP to assess the well-being of people has fuelled a growing interest in the multi-dimensional aspects of prosperity, with economists looking for better barometers of national progress (Daly and Posner, 2011). This partly comes from the observation made by many, that while GDP has more than doubled in the United States since 1980, median income, life satisfaction and some environmental conditions have not progressed as much. The debate on economic growth remains on “how much are we growing” but has acquired a new dimension regarding “how are we growing”. Some analysts talk about qualitative versus quantitative growth (Capra and Henderson, 2009). Others, such as former Federal Reserve Bank Chairman Ben Bernanke, have made a point of talking about the “economics of happiness”, referring to the use of subjective measures of well-being for policy analysis (Board of Governors, 2010).

Measurement efforts are starting to take root. Some state governments are developing measures going beyond GDP (e.g. Daly and Posner, 2011). In 2013, the state of Maryland adopted an alternative accounting system for the state – a measure of sustainable economic welfare called the “Genuine Progress Indicator (GPI)”, which integrates both the costs and the benefits of economic development into a monetary measure that aims to measure whether growth is truly enhancing the welfare of individuals and communities (Refining Progress, 2007). Other states (Vermont, Oregon, and Washington State) have followed Maryland’s lead and are also working to develop their own GPI measurement systems. At the federal level, the Bureau of Economic Analysis (BEA), the agency responsible for compiling the national accounts, has publicly embraced the need to go beyond GDP with measures that better capture economic well-being and sustainability (Landefeld et al., 2010). It has also made public a broad agenda for GDP and beyond measures (Landefeld et al., 2010), including a new framework for measuring household economic welfare.

Many other OECD countries have also launched initiatives to go beyond GDP. Examples include Australia (Measures of Australia’s Progress), Austria (e.g. Growth in Transition), Finland (Findicators), Germany (Enquete Commission “Growth, Prosperity and Quality of Life”), Italy [Measuring Equitable and Sustainable Well-being (BES)], the Netherlands (Sustainability Monitor) and the United Kingdom (Measuring National Well-being Programme) (Röhn et al., 2013). The OECD has been at the forefront of these efforts for example by developing guidelines for social statistics already in the 1970s, and participating in the Stiglitz-Sen-Fitoussi Commission (Stiglitz et al., 2009). The framework and recommendations of the Commission, as well as earlier OECD work, underpins OECD’s How’s Life reports (OECD, 2011a; OECD, 2013b), the flagship publication of the OECD Better Life Initiative.

At the same time, progress is being made to operationalise well-being policies. For example, the Division of Consumers and Community Affairs at the Federal Reserve Board, is charged with identifying emerging issues affecting disadvantaged communities and consumers, so as to inform policies seeking to improve the inclusion of these communities. Another example is the Partnership for Sustainable Communities (www.sustainablecommunities.gov), which co-ordinates federal investments across three federal agencies – Department of Housing and Urban Development, Department of Transportation and the US Environmental Protection Agency – under the spirit that although every region has different needs, economic, environmental and community policies need to be considered jointly to ensure multiple community goals are achieved in effective and efficient ways.

Figure 1.1. Well-being is high, but not for all



1. Source: OECD (2013), *How's Life? 2013: Measuring Well-being*.
 2. Happiness data are aggregated into a happiness index by running an ordered probit regression of life satisfaction on year fixed effects. Source: Stevenson and Wolfers (2008), based on data from US General Social Survey.
 3. Source: Stevenson and Wolfers (2013), based on Gallup Poll. Percentage of household by annual household income.
 StatLink <http://dx.doi.org/10.1787/888933081093>

What explains rising work-life pressures?

Work-life balance is often highlighted as a key concern in US life-satisfaction surveys. A recent Pew Research Center survey of adults employed at full or part time with children under 18 found that half of respondents have difficulties balancing work and family life (Parker and Wang, 2013). The current economic situation may be part of the story. Periods of economic instability often lead to higher work pressures, and an increased sense of job insecurity exacerbating work-life conflicts (Mc Ginnity and Russell, 2013). But work-life imbalances and job stress are not new problems. While the long-standing debates about the overworked American (e.g. Jacobs and Gerson, 2005) may be overstated by the media, time-use surveys and job-stress surveys support the claim that work-life pressures are significant and have increased over the past decades (Box 1.2).

Americans are clearly not alone in facing work-life conflicts, but some distinct features may be contributing to higher work-life tensions in the United States. People in employment work slightly longer hours (1 790 hours annually) in the United States than in

Box 1.2. **Work-life balance: How bad is it?**

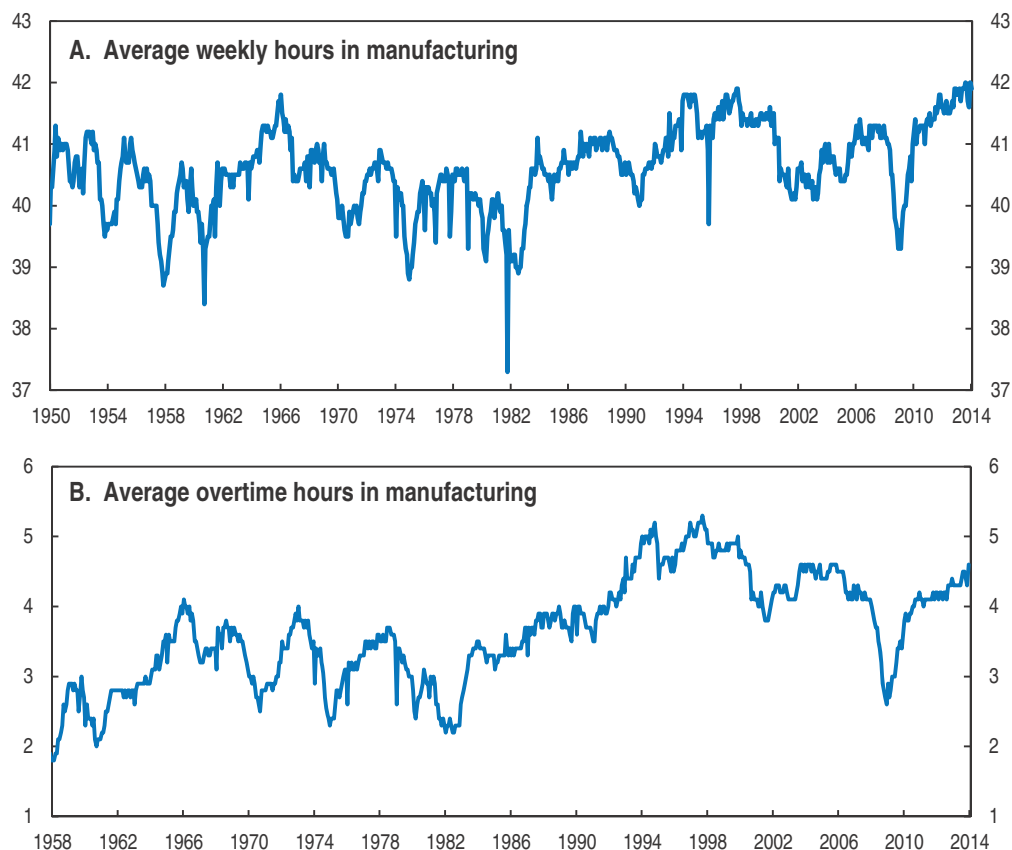
This is not an easy question to answer, because as noted by many, including OECD (2011a), measuring work-life balance is challenging. An ideal set of indicators would include measures of the occurrence of objective conflicts between daily activities, people's personal enjoyment of these activities, and their perceived time stress (OECD, 2011a). But these are hard to come by, especially in an internationally comparable way. Nonetheless, available data can help to paint a picture and the response is: not good.

The OECD Better Life Index ranks the United States 28th in the work-life balance indicator compared to other OECD countries. The work-life balance index is based on the proportion of employees working 50 hours or more per week (11% versus 9% OECD average), and the time people devote to their leisure and personal care (14.3 versus 14.9 hours). But this does not tell the whole story and needs to be complemented with other sources of data, most notably on the extent to which people are satisfied with their work-life balance, which can be obtained from US survey data:


- The 2008 US *National Study of the Changing Workforce* (Galinsky et al., 2011) suggests that work-life conflicts have risen for both men (from 34% in 1977 to 49% 2008) and women (34% in 1977 to 43% in 2008). Almost half mothers in dual earner couples (47%) report experiencing some or a lot of conflict in 2008, up from 41% in 1977. The majority of fathers in dual-earner couples (60%) report experiencing some or a lot of conflict in 2008, up from 35% in 1977.
- The 2013 *Pew Survey* (Parker and Wang, 2013) shows that 56% of working moms and 50% of working dads say they find it very or somewhat difficult to balance work and family responsibilities. Fathers in dual-earner couples experience more work-conflict than fathers in single-earner families (59% versus 49%).
- The 2013 *Survey by Workplace Options* shows that 41% of Americans wished they had more boundary between work and family, 36% feel uncomfortable taking a few days off, 41% would feel uncomfortable taking a full week of work, 61% feel uncomfortable taking off more than a full week.

While no comparable information exists for other OECD countries, surveys asking workers how satisfied they are with their work-life balance suggest that the situation is more worrying in the United States than elsewhere. For instance, the European Quality of Life Survey shows that on average about 25% of European workers were dissatisfied with their work-life time balance in 2007 (OECD, 2011a). For Canada, the General Social Survey shows the proportion of workers that felt somewhat or very dissatisfied with their work life balance was 20% in 2001 (Wilson Banweel, 2006).

Figure 1.2. Working time has increased in the manufacturing sector



Source: US Bureau of Labor Statistics.

StatLink  <http://dx.doi.org/10.1787/888933081321>

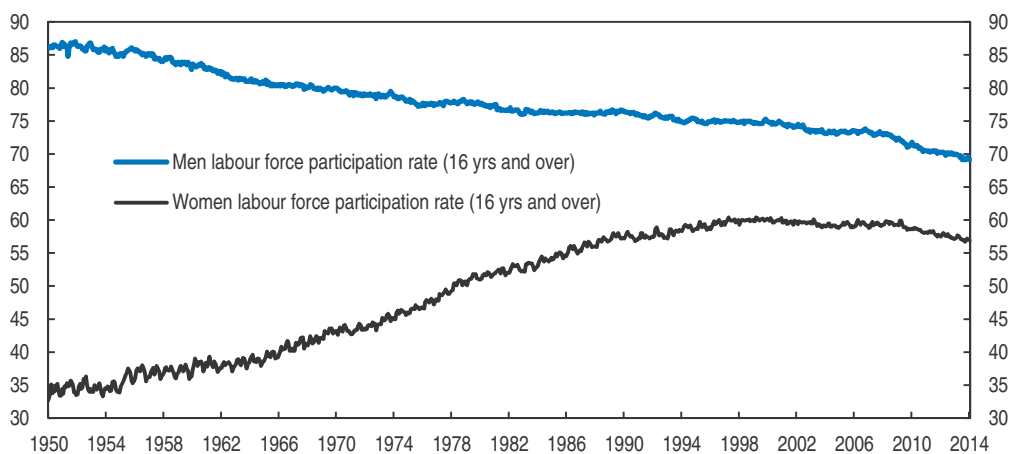
most OECD countries (OECD average of 1 765 hours) (OECD *Employment Outlook*, data for 2012). Working hours and overtime have increased in the manufacturing sector, with a historical peak of some 42 hours reached recently (Figure 1.2), though in other industries they have declined.

The Fair Labor Standards Act (FLSA) requires that covered non-exempt employees receive overtime pay for over 40 hours a week at a rate not less than 1.5 times their regular rates of pay. There are a variety of ways to exempt employees from the FLSA overtime provisions. For example, to avoid paying overtime wages, an employer may designate a worker as exempt if the employee is compensated on a salary basis; earns more than USD 455 per week; the employee's primary tasks are in office work; and the employee's "primary duty includes the exercise of discretion and independent judgment with respect to matters of significance". As a result, a worker whose earnings are insufficient to keep his or her family above the poverty level can be classified as managers and therefore exempt from overtime. There are also rules to justify exemptions for executives, learned professionals, creative professionals, certain computer employees, certain sales employees, and highly compensated employees. It is thus encouraging that the Administration has rightly proposed to raise the threshold of USD 455 per week, which has been changed only once since 1975.

Work-life conflicts are particularly acute for households with children, particularly since more women have joined the labour force (Figure 1.3), thus raising the proportion of dual-earner couples and the total amount of hours of paid work by the typical couple (Figure 1.4). Labour-market participation of mothers with children under 18 increased from 45% to 78% between 1965 and 2000 (Bianchi and Raley, 2005; Bianchi, 2010). Home care has become less time consuming thanks to appliances becoming widely available, but this time has been transferred to paid work and childcare, thus compressing the free time available for leisure and personal care. Dual-earner families with children under 18 have therefore become more “time poor”.

Figure 1.3. **Convergence of men and women labour-market participation**

In percentage

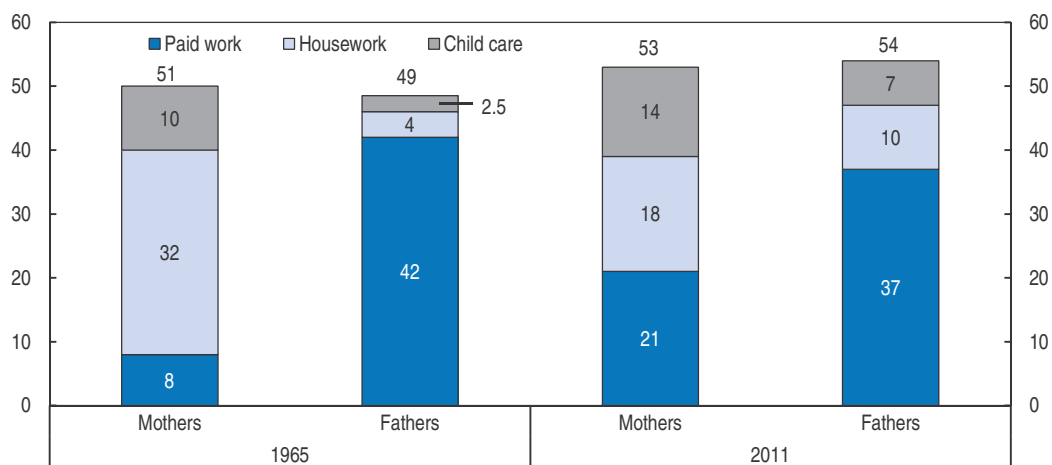


Source: US Bureau of Labor Statistics.

StatLink  <http://dx.doi.org/10.1787/888933081340>


Figure 1.4. **American families are facing rising time pressures¹**

Average number of hours per week



1. Based on adults ages 18-64 with own child(ren) under age 18 living in the household. Total figures (at the top of each bar) may not add to component parts due to rounding.

Source: Pew Research Center (2013).

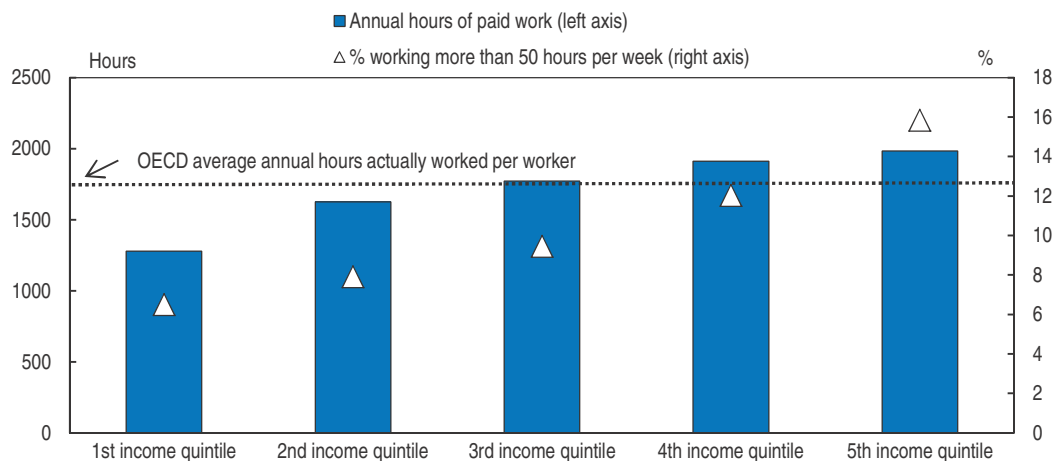
StatLink  <http://dx.doi.org/10.1787/888933081150>

Single mothers are particularly exposed to time pressures (Bianchi, 2010). Among less educated women a large proportion of births are to unmarried women. In many of these cases, the father lives with the mother at the time of birth, but these families are quite fragile. Among unmarried mothers at the time of their child's birth, only 36% are still living with the child's father when the child is 5 years old (Carlson and McLanahan, 2010). In addition, the fact that people are living longer than in the past results in added responsibilities to families for the care of older family members (Shrestha, 2006). Middle-aged adults, in particular women, often need to care for their parents, while caring for their children who, contrary to the past, often do not leave home until well into their 20s (Bianchi, 2010). Overall, these factors add to the complications of managing family life while breadwinning, in particular for single parents who have less time but also are significantly more poor.

Work-life conflicts and job stress pose risks to the well-being of workers and their families. Time-diary evidence suggests that work-life conflicts lead to a reduction in time spouses spend together, and the time people have for themselves (Bianchi, 2010). Working mothers in particular give up leisure and sleep, compared to mothers not in the labour force, to meet the demands of child care and jobs. Longer working hours mean higher income, but not necessarily greater happiness. A new study produced for this Survey (Caldera Sánchez and Tassot, 2014) shows that those Americans who spend more time walking or exercising are happier, while those who work more than 50 hours per week are more likely to be unhappy and to have higher levels of anxiety.


High-income families work very long hours (Figure 1.5). They are also more likely to work in professions, such as management, business and financial occupations, that are liable to long hours and higher work demands. On the other hand, they have better quality jobs, higher wages, more autonomy and control over their work schedules, or can to some extent choose their work schedules. High wage workers also have higher rates of access to paid-leave or to flexible work arrangements. For instance, data from the National

Figure 1.5. **Working time challenges vary across income groups**



Note: Data from the American Time Use Survey (ATUS) refer to a population in the labour force. The income quintiles are defined with respect to the distribution of household incomes with respect to the entire population.

Source: OECD analysis based on ATUS (2012).

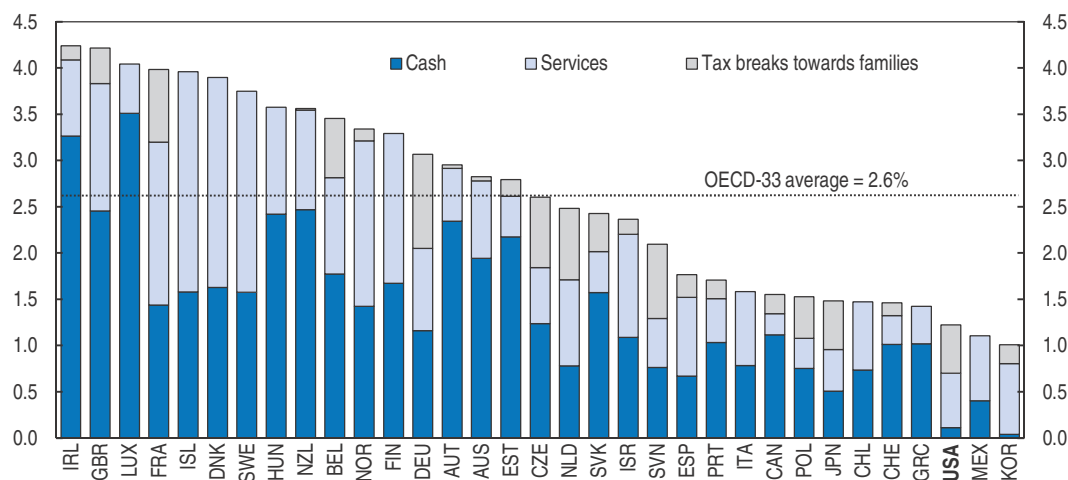
StatLink  <http://dx.doi.org/10.1787/888933081359>

Compensation Survey shows that access to paid leave is more likely if an employee is well paid, works in a managerial or professional occupation, or is employed by a company with at least 100 employees. Data from the American Time Use Survey further shows that among high wage employees, 83% of workers earning more than USD 1 230 a week report that their employer allows them to earn paid time off or to change their schedule if they have family conflicts, but only half of workers earning less than USD 540 a week have access to paid leave. Professionals are also more likely to have the type of jobs that allows them to preserve their skills by using them (OECD, 2013c), and to access training that will enhance their earnings potential (Holzer, 2012). All these elements help as they have a positive effect not only on work-life balance, but on workers' well-being as well (ILO, 2012).

Work-life conflicts can have implications for the economy more broadly. First, job demands can crowd out quality time spent with children (Gauthier et al., 2014), leading to lower investment in children's human capital. Evidence from time diary data, going back to the 1960s, shows that US parents have shielded their children from increasing work pressures by spending more time with them than ever before (Figure 1.4). However, not every parent is spending the same quality time with their children. Perhaps not surprisingly, high-income high-educated American parents are much more engaged in the type of intensive child rearing, like reading or playing, which is beneficial for children in the long term than low-income low-educated parents (Bianchi, 2010). Such disparities can lead to widening inequalities in later years. Due to financial constraints, low income parents face higher barriers to access quality preschool and childcare that can offset their weaker skills and weaker parental investment. As well, long working hours and lack of flexible-work practices in professions that value overwork can push women, in particular mothers, out of high paying jobs, increasing occupational segregation and reducing their earning potential (Goldin, 2014; Goldin and Katz, 2011). This means lower wages for women, and a wider gender wage gap than otherwise, offsetting efforts to improve gender equality. But if these women drop out of the labour force, or work in professions for which they are overqualified, it also means a loss of human capital for the economy.

How work-life conflicts affect individuals and families depends in part on how people can cope with job pressures, which in turn depends on their own resources, and on the support available to them through their jobs and the public sector. Overall, public policies play a more limited role in offsetting such pressures in the United States than elsewhere in the OECD (Figure 1.6). The United States, for example, is the only OECD country without a national paid parental leave policy. Support varies across states, but public spending on early education and care for infants and pre-kindergarten children amounted to around 0.4% of GDP in the United States in 2009, compared to 0.7% of GDP, on average, across the OECD. The business sector, on the other hand, is a key determinant of the well-being of workers, perhaps even more than elsewhere. Most jobs are in the private sector where firms, more than elsewhere, are free to decide employment conditions and how quickly and cheaply workers may be fired. Most people get their health insurance from their employer and the same applies to pensions.

Figure 1.6. **Public spending supporting families is low in the United States¹**
In per cent of GDP (2009)



1. Public support accounted here only concerns public support that is exclusively for families (e.g. child payments and allowances, parental leave benefits and childcare support). Spending recorded in other social policy areas such as health and housing support also assists families, but not exclusively, and is not included here. Data missing for Turkey. Data on tax breaks towards families is not available for Greece and Hungary.

Source: OECD, *Social Expenditure Database* (2013).

StatLink  <http://dx.doi.org/10.1787/888933081378>

Work-life conflicts have negative health consequences

Long working hours in paid employment combined with long hours of unpaid work are likely to have negative consequences for health (Dembe et al., 2008; Darden, 2014; Barnay, 2014). Furthermore, econometric work conducted for this chapter shows that health is considered by households in the United States as an important dimension of well-being (Box 1.3). Thus, work-life imbalances can lead to poor health, which in turns undermines well-being. This is a cause for concern because some changes in working conditions – notably just-in-time delivery, atypical employment contracts and lower job security – contribute to job strain and employment-related stress. This is happening at a time when the demographic ageing of workers may exacerbate this detrimental health impact.

The empirical health literature has established that stressful working conditions can have a detrimental impact on health, especially among workers who have a low capacity to cope with stressful environments. Stress causes the adrenal glands to release hormones that elevate heart rate and blood pressure. This can have positive implications in the sense that these hormones boost energy in situations characterised by conflict. However, when stress becomes chronic – constant stress over a long period of time in which hormone levels stay elevated – the health consequences can be severe. The medical literature has emphasized the relationship between stress and cardiovascular ailments. The mechanism through which job stress affects cardiovascular health is blood pressure. For instance, a high imbalance between workplace effort and reward has been found in the Netherlands to be associated with higher systolic blood pressure whether at work or not and a higher heart rate at work (Vrijkotte et al., 2000). Burke and Cooper (2008) report that long working hours tend to be associated with unhealthy lifestyle choices, such as smoking, excessive coffee intake and alcohol consumption, lack of exercise and poor diet.

Box 1.3. What matters for Americans?

Measures of subjective well-being can be a good measure of quality of life and help to understand what matters for people, beyond people's income and material conditions (Stiglitz et al., 2009). Data from the American Life Panel was used to carry out econometric analysis to understand how the various dimensions of the OECD Better Life Framework impact subjective well-being. The results, elaborated in Caldera Sánchez and Tassot (2014), can be summarised as follows:

- **Income:** After controlling for time use, age, gender, marital status, education, ethnicity, and employment status, increases in income are statistically significantly positively correlated with life satisfaction, household income satisfaction, satisfaction with job or other daily activities, and higher frequency of being happy.
- **Health:** Time spent on health-related activities, such as visiting a doctor, taking medications or doing treatments, is associated with lower happiness, and higher levels of anxiety, while an improvement in self-reported health leads to higher well-being in all domains, and is on average associated with higher well-being and lower frequency of feeling worn out. Furthermore, benefiting from health insurance coverage is associated with an increase in all subjective well-being domains, controlling for individual heterogeneity, self-reported health and employment status.
- **Work-life balance:** Time spent on walking or exercising, or spent with family and friends is significantly and positively correlated with overall life satisfaction as well as overall happiness experienced throughout the day. In addition, time spent walking or exercising is associated with lower levels of anxiety. An indicator for those working more than 50 hours per week shows higher levels of anxiety for this group of workers.
- **Unemployment:** Controlling for income and other demographic characteristics, the unemployed are significantly less satisfied with their lives, their daily activities and household income, and are less happy than the working population. The onset of unemployment, controlling for changes in income, is associated with significant decreases in life satisfaction, satisfaction with household income and daily activities, as well as happiness. Conversely, returning to work is associated with increases in those subjective well-being domains.
- **Disability:** Disabled individuals show strong similarities with the unemployed, with lower life satisfaction and happiness. They are also more likely to report to feel worn out. Retired individuals and homemakers report overall significantly higher well-being levels than working individuals.
- **Housing:** Home owners are on average more satisfied with their household income and those acquiring a home report significantly higher levels of well-being.

A survey by the American Institute for Stress reports that 35% of workers said their jobs are harming their physical or emotional health. Furthermore, 80% of workers feel stress on the job; nearly half say they need help in learning how to manage stress; and 42% say their co-workers need such help. A 1999 report from the National Institute for Occupational Safety and Health (NIOSH) found that 40% of workers reported their job as very or extremely stressful; 25% viewed their jobs as the number one stressor in their lives; 75% of employees believed that workers have more on-the-job stress than a generation ago; 29% of workers felt quite a bit or extremely stressed at work; and 26% of workers said they were “often or very often burned out or stressed by their work”.

The US health insurance system has contributed inadvertently to job stress. This is because employer-provided health insurance, a unique form of the US health system, has led to job lock – a situation in which a worker stays in a job despite the desire to seek other employment. When a worker is poorly matched to a job or is unprepared for or unaware of the stress that comes with a job, job lock may imply chronic stress situations that lead to poor health outcomes. Indeed, Madrian (1994), the seminal paper in the job-lock literature, suggests that employer-provided health insurance creates a job-lock effect in which voluntary turnover rates are 25% lower for those with health insurance. Thus, if a worker is mismatched in her job, but remains because of employer-provided health insurance, this tension may generate job stress. Furthermore, if a worker worries about losing her job because of unaffordable health insurance on the individual market, then a correlation is observed between stress and local labour market conditions in the empirical literature. Expanding health insurance coverage – either through the public provision of insurance or otherwise – may lessen job strain through a number of mechanisms. Thus, ACA may reduce stress and improve mental health if the individual insurance market exchanges are successful in providing affordable health insurance policies.

Work-life conflicts and job stress do not only pose risks to workers' health and well-being, they can also affect companies' performance. In a meta-analysis, Gilboa et al. (2008), found that work-family conflict is negatively correlated with both self-rated work performance and general performance, lending support to another meta-analytical review which highlighted the potentially negative effects of work-family conflict on general job performance (Allen et al., 2000). Difficulties in balancing work and family life can also contribute to stress leading to mental health problems, absenteeism, lower productivity and higher disability, as well as illness such as cardiovascular diseases.

Although it is too soon to draw lessons from the implementation of ACA, it may help reduce these problems. This conjecture can be informed by a randomised experiment of Medicaid expansion conducted in Oregon, where researchers found that being insured – relative to being uninsured – is associated with a 32% increase in self-reported overall happiness (Finkelstein et al., 2012) and a decrease in the probability of a positive depression screening of 9.15 percentage points (Finkelstein et al., 2013). Lower rates of depression are not surprising given that Finkelstein et al. (2013) also find that receipt of coverage “nearly eliminated catastrophic out-of-pocket medical expenditures”. Furthermore, in addition to potentially alleviating stress related to medical expenditures, the ACA represents a large expansion in mental health services as all health plans on the private exchanges are required to cover mental health and substance use disorder care.

The Administration has also recently taken steps to support the health of those with mental problems by issuing rules that require insurers to cover care for mental health just like physical illness. The rules ensure that health plans' co-payments, deductibles and limits on visits to health care providers are not more restrictive or less generous for mental health benefits than for medical and surgical benefits. Significantly, the regulations clarify how parity applies to residential treatments and outpatient services, where much of the care for people with addictions or mental illnesses occurs.

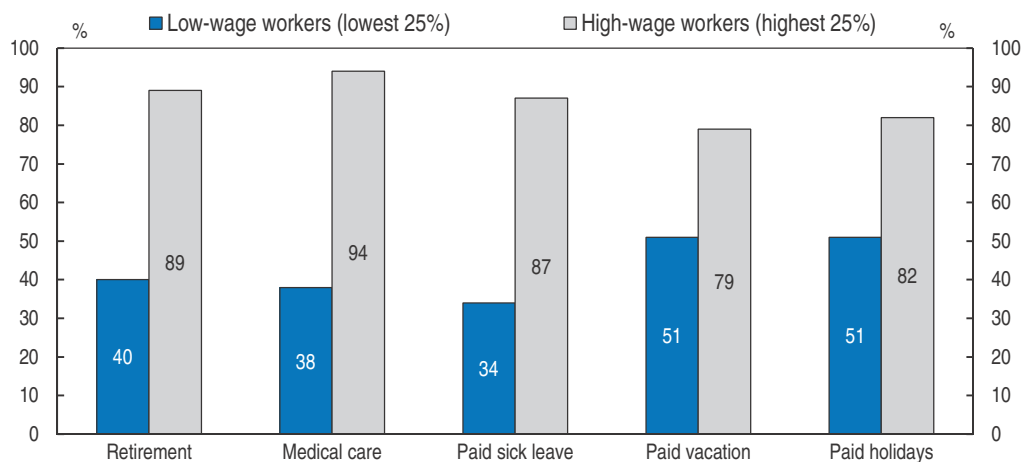
Such measures will not only help those with mental problems, but can contribute to stem the important productivity losses derived from mental health disorders for those at work (OECD, 2010). However, adequate prevention and early intervention are also critical, especially for identifying the negative side-effects from stressful working conditions on

health. Prevention efforts could be stepped up by monitoring prolonged sick leaves, job loss and disability-benefit claims. Engaging actors outside the Administration, most notably employers, could also help to improve awareness about the possible negative side-effects of job stress on mental and physical health and improve health outcomes and productivity.

Job quality matters for wellbeing


Work-life conflicts and health-related stress is related to the quality of jobs, which varies a lot across firms and industries. Jobs of poor quality come with low wages and mediocre health insurance, combined with modest pension and paid leave benefits (Figure 1.7). These jobs are disproportionately found in the retail and leisure/hospitality sectors, where non-standard work schedules, such as shift work, night work and weekend work are common (Mishel et al., 2012).

Figure 1.7. **Low-wage workers have fewer benefits in the private sector (2013)**



Note: Data refer to all private industry workers and include part-time workers.

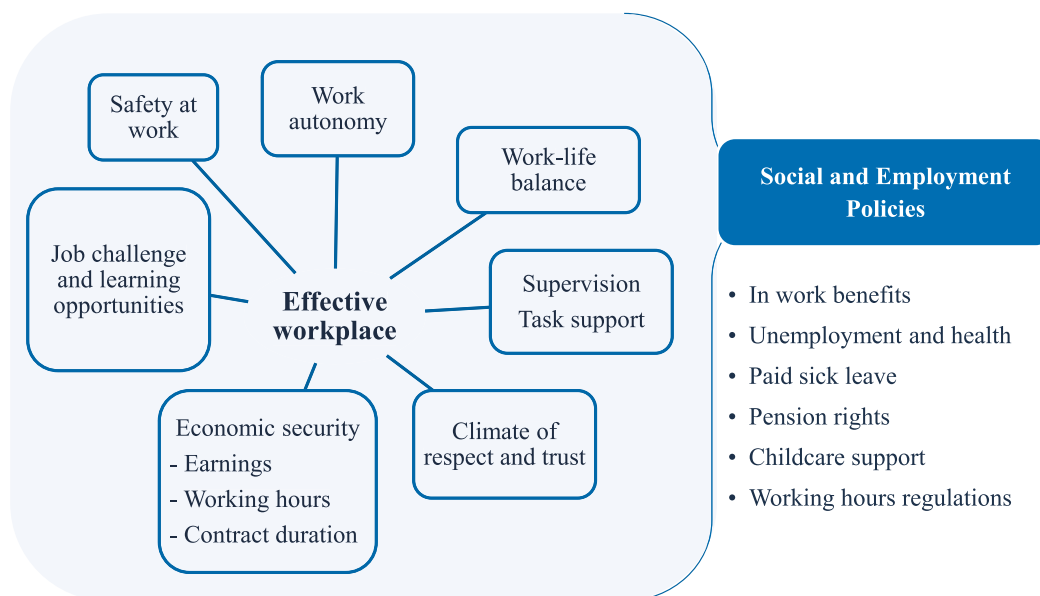
Source: US Bureau of Labor Statistics, National Compensation Survey.

StatLink  <http://dx.doi.org/10.1787/888933081226>

This suggests that effective policies to reduce work-life conflicts and job pressures will clearly hinge on improving the quality of jobs and expanding access to high-quality jobs. There can be many elements in a good job, as discussed in OECD (2013b; 2014a), and depicted in Figure 1.8, including pay, access to learning opportunities, and working hours. While many of these are shaped by the institutional and policy framework governing the labour market, many are purely business issues. This is most evident in the fact that some employers are recognising that such good jobs can also mean good business (Gallup, 2010). For instance, good jobs can help to attract and retain good workers, leading to savings in recruitment and gains in productivity, among other benefits (OECD, 2013b). However, as the evidence described above shows, many jobs do not pay enough or provide enough support to increase well-being through work while helping to meet other caring demands at home.

Why are more firms not adopting such promising practices that lead to quality jobs if they lead to higher productivity? For one, because the business case for better jobs is most evident for high-end professional jobs, where talent is hard to find, and recruitment and training costs are substantial (Holzer, 2012; OECD, 2007). But even among those high-end professions, practices that lead to higher well-being at work, such as flexible workplace

Figure 1.8. Which are the characteristics of good jobs?



practices, are not so common (CEA, 2010). A variety of market failures might be hindering firms in creating more socially optimal quality jobs, such as lack of information on best management practices, which can motivate further government intervention to encourage wider adoption.

The working poor face different well-being challenges

A large number of US workers receive labour income that is not sufficient to keep them above the poverty level. The Federal minimum wage was set at USD 7.25 in July 2009 and kept unchanged subsequently. Although relatively few workers report wages exactly equal to (or below) the minimum wage, a much larger share of workers earns wages near the minimum wage. This holds true in the states that comply with the federal minimum wage, in addition to those states that have instituted their own higher minimum wage levels. Thus, out 46.5 million persons, or 15.0% of the population, living below the official poverty level, 10.6 million were considered to be “working poor” in 2012 (7% of workers) (source: Department of Labour). In addition to low hourly wages, many of the working poor are engaged in involuntary part time employment. Long working hours may be less of a problem for them than for full-time workers, thus improving this dimension of well-being, but short hours result in low earned incomes, with a detrimental impact on life satisfaction. Raising the earnings of the working poor is therefore an important aspect of a well-being strategy.

An important policy tool to raise the earnings of the working poor is the Earned Income Tax Credit (EITC), a large and successful antipoverty programme. It provides low-income workers, many of them poor, with extra income via refundable tax credits. It also encourages low-income parents to take up work by lowering their tax rate and by providing a financial bonus for their work. Several studies have shown that the EITC has been particularly successful in increasing the employment of single mothers and in reducing poverty in households headed by single mothers (See Meyer 2010 for a recent review of the literature). While some evidence suggests that the EITC has led to a reduction

in the labour force participation of married mothers (Eissa and Hoynes, 2004) and reduced hours of work due to the fact that the credit is targeted on family earnings (Heim, 2006), the effect is small. In fact, more recently, Chetty et al. (2013) find that the EITC has raised net incomes at the low end of the income distribution significantly, with a limited negative effect on employment through disincentive effects.

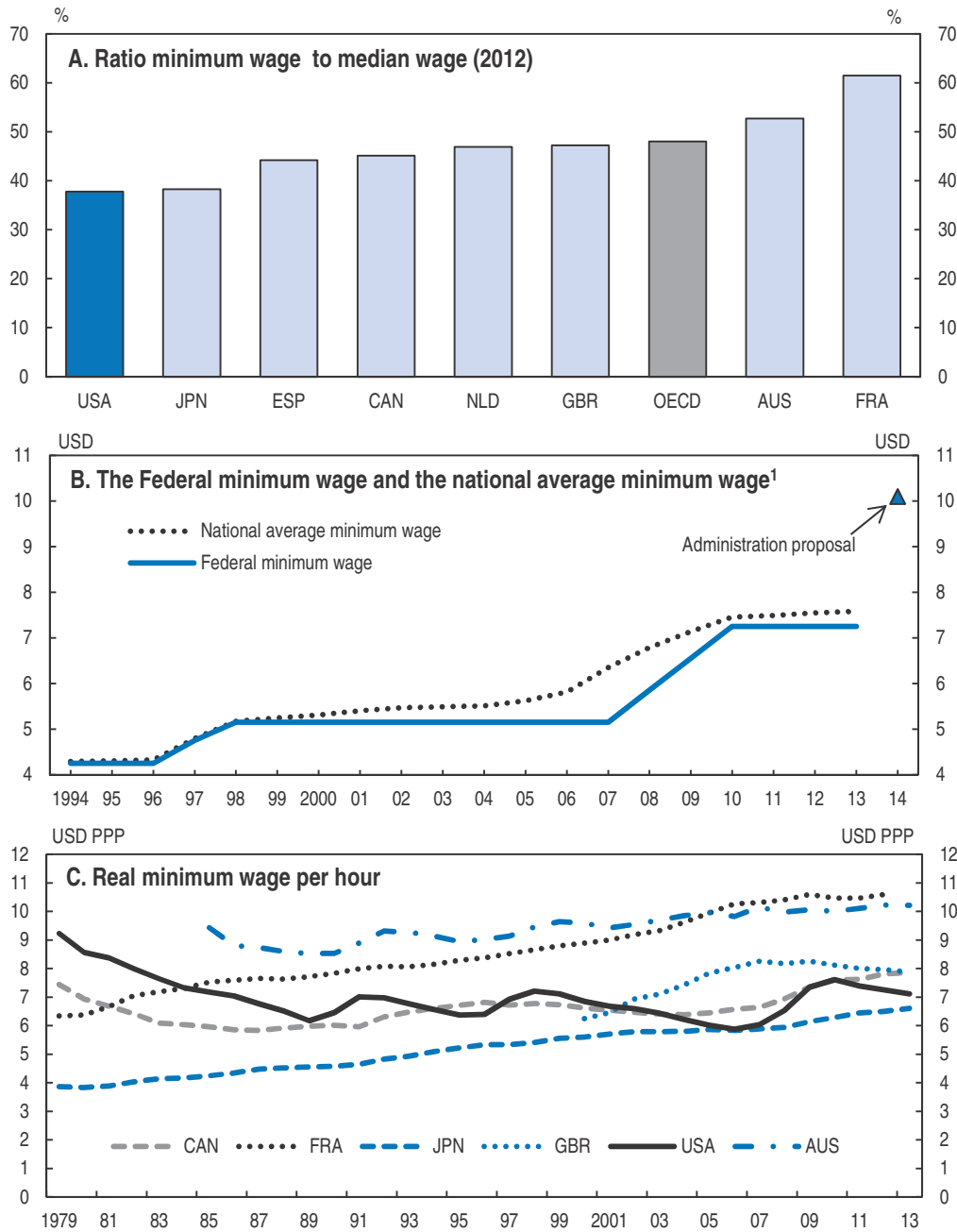
A family with children can qualify for an EITC up to USD 6 143, but the credit is much less generous for childless workers (USD 496). The EITC is thus less effective at increasing employment and reducing poverty among childless workers, many of whom receive low wages. Moreover this small credit is not available to all low-income workers, but only for those aged 25-64. The Administration has called for strengthening the credit for childless workers. While little detail exists on the exact policy design, work by Edelman et al. (2009) suggests that strengthening the credit for childless workers and lowering the age threshold from 25 to 21 years old would benefit low-income workers with relatively poor education, helping to fight poverty by transferring income to those with few resources. It could also help improve the economic prospects of young workers, many of whom are still struggling, given the still-high youth unemployment rates.

Broadening the EITC will cost money. However, Sahwill and Karpilow (2013) suggest that combining an increase in the minimum wage with a tripling of the EITC for childless workers would save enough money to pay for the expanded EITC through fewer welfare payments and higher tax collection. Additional funding could also come from reducing the costs of administering the programme and fighting non-compliance (Meyer, 2010). The IRS estimates that about 20% of the EITC payments made in fiscal year 2012 were paid in error (TIGTA, 2013), and similar figures have been found for earlier years.

The EITC is less effective in raising incomes than it could be because employers capture part of the benefits through lower wages (OECD, 2009). Setting the minimum wage at a reasonable level can avoid this effect by supporting wage levels. The Administration has recently proposed to raise the federal minimum wage and tie it to inflation (CEA, 2014). At USD 7.25 per hour, the current federal minimum wage is 38% of the median wage for full time workers, well below the 48% average in the twenty-four OECD countries with a statutory minimum wage (Figure 1.9). If the minimum wage were gradually raised to USD 10.10 by 2016, this would bring it to approximately half the median wage, close to the OECD average, providing a boost to the purchasing power of many low income workers. Moderate and low-income families would benefit most from an increase in the minimum wage, as the majority of minimum wage earners have a family income below the median (USD 60 974 in 2011) and nearly a quarter have family incomes below USD 20 000 per year (Figure 1.10).

Plentiful empirical evidence suggests a modest increase in the minimum wage from such a low level will have no or only a small negative effect on employment of low-skill workers (Doucouliagos and Stanley, 2009; Dube et al., 2010; Wolfson and Belman, 2013). For instance, recent meta-analysis of a large set of studies looking at the relationship between employment and the minimum wage on teenage employment (Doucouliagos and Stanley, 2009) and on teens and fast food workers (Wolfson and Belman, 2013) conclude the effects are statistically detectable but economically small. Estimates from the CBO suggest that gradually increasing the minimum wage to USD 10.10 by 2016, as currently proposed, would reduce total employment by about 500 000 workers or 0.3% (CBO, 2014). CBO notes that as with any such estimates, however, the actual losses could be smaller or larger; there

Figure 1.9. **The US minimum wage has fallen behind**



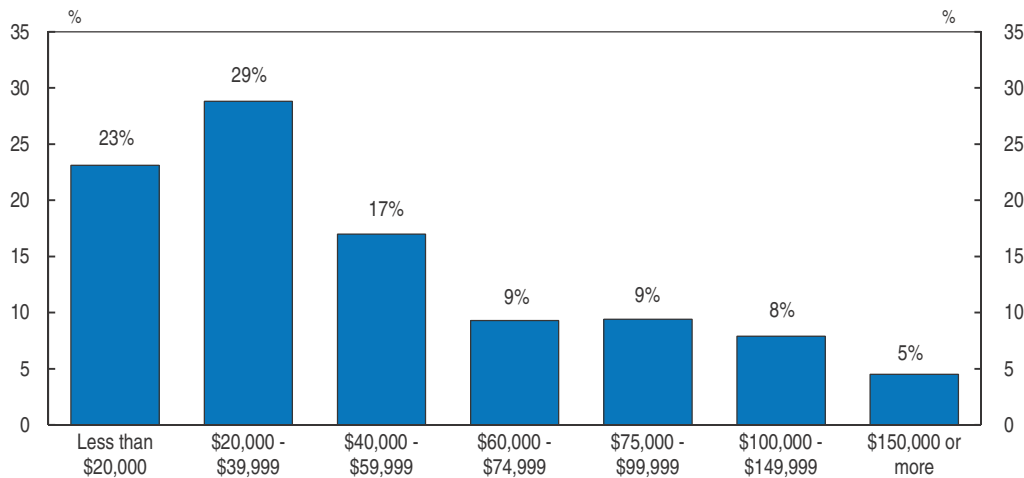
1. The national average minimum wage is calculated as the average of minimum wages prevailing in each US state, weighted by the percentage share of each state in the US population.

Source: OECD, Labour Statistics Database; US Department of Labor and OECD calculations.


StatLink <http://dx.doi.org/10.1787/888933081169>

Figure 1.10. Raising the federal minimum wage would have ripple effects

Share of affected workers by raising the federal minimum wage to USD 10.10 by July 2016



Source: Cooper, D. (2013). "Raising the federal minimum wage to USD 10.10 would lift wages for millions and provides modest economic boost", *Briefing Paper*, No. 371, Economic Policy Institute.

StatLink  <http://dx.doi.org/10.1787/888933081416>

is about a two-thirds chance that the effect would be in the range between a very slight reduction in employment and a reduction in employment of one million workers (CBO, 2014). Such increases would benefit the large majority of low-wage workers and raise earnings for an estimated 12 million people now in poverty, lifting as many as 2 million of them out of poverty (CEA, 2014). Nonetheless, the effect on an increase in the federal minimum wage on the employment of teenagers and other low skilled workers should be carefully monitored.

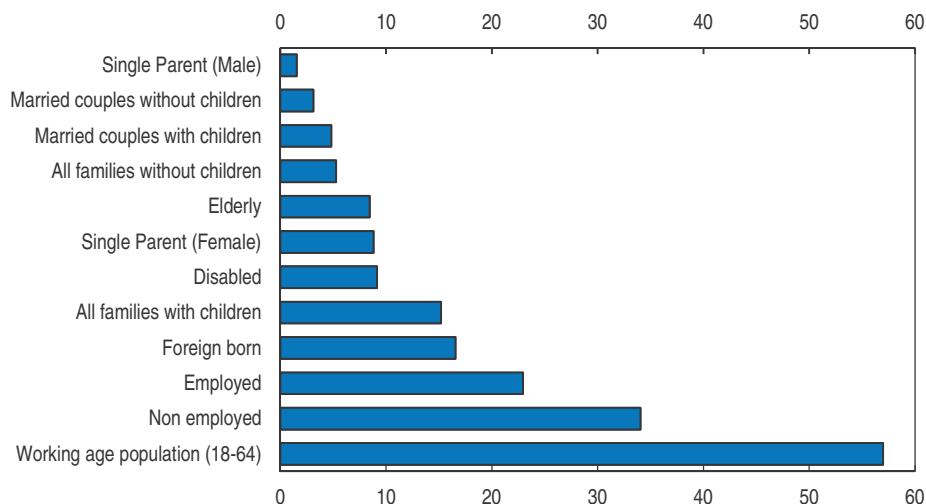
There are limits to the extent increasing the EITC and the minimum wage would help to reduce overall poverty or lead to higher incomes more generally, because such policies offer little support to the large majority of poor who are not employed (Figure 1.11). Improving the employment prospects of the unemployed through higher skills is a promising way forward.

Family paid leave and flexible workplaces

Paid family leave allows parents to look after young children when they are most vulnerable, promoting child development without forcing parents to sacrifice their careers and can contribute to the labour force attachment of mothers (OECD, 2007). Yet, the majority of workers do not have paid family leave that allow them to take off to meet family responsibilities, such as the arrival of a newborn, or a seriously ill family member, while still meeting their work responsibilities. For instance, the United States is one of four countries in the world, and the only high-income country, which provides some form of maternity leave but where there is no general legal provision of cash benefits (ILO, 2010). Workers without paid family leave combine paid sick days or vacation or take unpaid leave if they can afford it, or quit their jobs altogether (Shriver, 2014).

The Family and Medical Leave Act (FMLA) provides some support by allowing workers in large companies to take up 12 weeks of job protected unpaid leave, but many do not take it or take short leaves because they cannot afford the full 12 weeks of unpaid leave (Klerman et al., 2013). Some states provide paid family leave or other type of support. For

Figure 1.11. **The American poor are a heterogeneous group**¹
As a percentage of total US population below the poverty level



1. Following the Office of Management and Budget's directive, the Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is in poverty. The official poverty thresholds do not vary geographically but are updated for inflation using Consumer Price Index. The official poverty definition uses money income before taxes and does not include capital gains or noncash benefits (such as public housing, Medicaid, and food stamps). If a family's total income is less than the family's threshold, then that family and every individual in it is considered in poverty. For instance, in 2011, the annual threshold for one person (unrelated individual) was USD 11 484 whereas for a family including 5 persons (2 adults and 3 children under 18 years), the threshold was USD 26 844.

Source: US Census Bureau.

StatLink  <http://dx.doi.org/10.1787/888933081435>

instance, California and New Jersey have enacted policies to provide workers with paid leaves, and others are in the process of doing it. A handful of states have passed laws above the FMLA requirements (IWPR, 2013) and a few others have temporary disability insurance or cash sick leave benefits, which can be used for parental leave (Thévenon and Solaz, 2013). Companies are moving forward too and some employers provide paid parental leave to their employees, while other employees get covered through sick leave insurance (Kamerma and Waldfogel, 2010; Thévenon and Solaz, 2013). The 2012 FMLA Survey shows that about one third of employees work for an employer offering paid maternity leave, and a fifth has paid paternity leave. Still it is important to note that statistics differ, and the true numbers may be lower than that. For instance, according to the 2012 National Compensation Survey only 12% of employees have access to paid leave for care of family members (newborns, adopted children, or ill children or adults) (IWPR, 2013).

Lack of effective support is possibly most worrying in the case of leaves for mothers following child birth. Conditions vary across states and companies and data are scarce, yet the fact that most women (86%) in the top family-friendly companies take less than 12 weeks of paid leave for birth (IWPR, 2013) suggest maternity leave for most falls below the 12 week minimum recommended by the International Labour Organization to safeguard the health of mother and child (ILO, 1998). There are also inequalities in access that are possibly hurting the disadvantaged most. Data show that access to paid leave is more common if an employee is well paid, works in a managerial or professional occupation, or is employed by a company with at least 100 employees (DOL, 2012).

Beyond health and equity reasons, there are economic arguments for expanding access to paid family leave. Evidence shows that there are labour market gains of paying income support to mothers by strengthening their labour force attachment, reducing turnover costs, improving their wages and shortening the length of time mothers are out of the labour market (Thévenon and Solaz, 2013; Bassanini and Venn, 2008). There are also reductions in receipts of public assistance (Houser and Vartanian, 2012). These are important in a country with declining labour force participation and high rates of poverty among single mothers, which lead to high child poverty rates. Such expansion could also contribute to achieve greater gender equality at home and at work, as evidence shows that fathers who benefit from leave around child birth spend more time with their children (Huerta et al., 2012).

To expand access to paid family leave for more workers the federal government could build on the successful experiences of California and New Jersey and develop a national social insurance programme for paid leave for all workers funded by a small increase in the payroll tax, as proposed in the Family and Medical Insurance Act recently introduced in Congress. While business may be concerned about such policy changes, evidence from California shows that the introduction of paid leave had minimum impact on business operations, and some even report positive effects on their productivity, profitability and on employee morale (Appelbaum and Milkman, 2011). A perhaps less politically difficult and more gradual approach could be to keep supporting states that want to follow the example of California and New Jersey with technical assistance. This risks being a slow process, though, judging from the experiences of those States that have paid family leaves.

Other options include increasing the use of family leave by using information campaigns. Evidence from the 2012 FMLA Survey shows that many employees had not heard of the FMLA (34%) or did not know they were covered (41%) (Kelman et al., 2013). Guaranteeing job protection to workers in small businesses which are not covered by the FMLA, could also help, evidence however suggests that for employees to take leave it needs to be paid. Pre and post-natal visits could also be more widely used to inform parents about the importance of maternal and paternal involvement for child well-being.

Many American companies have policies in place that allow their workers to better manage their work-life conflicts. For instance, many employers say that they allow their employees to periodically change their starting and quitting times (77%), or to take time off when important needs arise (87%), according to the 2012 National Study of Employers. Some employers provide help to their employees to pay for child care and provide information to their employees about services for elderly family members (41%). Most employers offer at least some workers the ability to return to work gradually after a major life event, such as birth or adoption of a child.

More could be done to expand these benefits to more workers, in particular to those in low-paying fields who often work too few hours to financially support their families and are more likely to face unpredictable and shifting schedules. Professionals in well-paid jobs could also benefit, as there is evidence that women in some high-paying professions are trading working-time flexibility for wages (Goldin, 2014), leading the United States to lose important investments in human capital and undermining efforts to close the gender pay gap. Business could benefit as well, as there is evidence that the costs of jobs stress are substantial on their bottom line, through increased health expenditure and absenteeism, as well as diminished productivity (Goetzel et al., 2004).

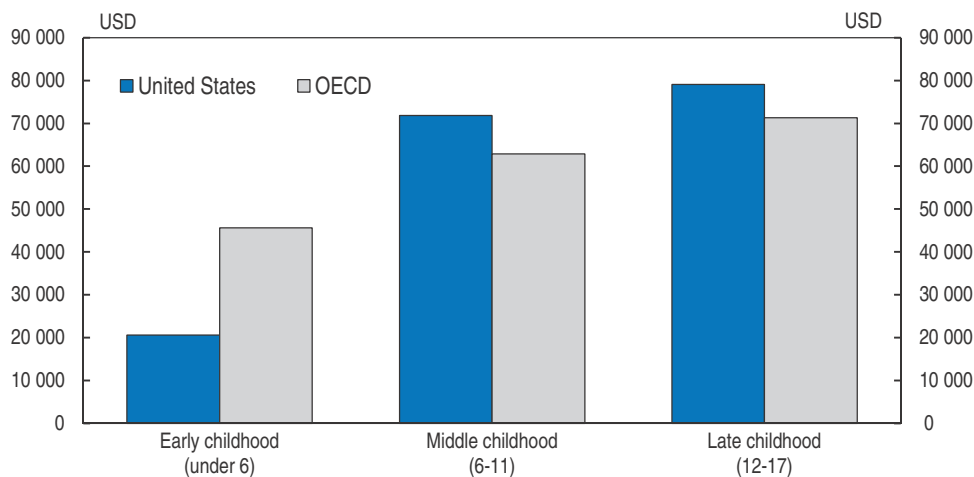
Encouraging more flexible workplaces is a challenge other OECD countries are facing as well, especially for the less skilled, given that the business case for them is less straightforward (OECD, 2007; OECD, 2011b). However, some useful experiences can serve as examples. Many countries put in place information campaigns to increase awareness on the benefits of family-friendly policies for employees and workers. For instance, the Swiss authorities have developed a handbook which outlines the business case for family-friendly policies, provides an overview of possible workplace measures and examples and addresses issues that may hinder reform (SECO, 2007).

Another promising option is the establishment of right-to-ask policies, which allow employees to ask their employer for flexible working times to accommodate caregiving responsibilities. For instance, the United Kingdom has established the right to request flexible working hours and, according to the Confederation of British Industries, it is now widely used by businesses. Right-to-ask policies have also been adopted recently by the State of Vermont and if successful could be scaled up nationally. Right-to-ask policies have the benefit of being less stringent on businesses than other policies that encourage family-friendly workplaces, such as legal requirements to provide changing working hours that exist in Germany, the Netherlands or Sweden. Another benefit is that they emphasise employer and employee involvement and do not involve one-size-fits-all solutions. Yet it is important to note that for right-to-ask policies to work, the legislation needs to provide a clear definition of the procedure and the business grounds on which the request may be turned down. Additionally, it is more likely to succeed if accompanied by resources and personnel on how to use them.

Early education and childcare

Public education spending mostly supports compulsory public education, which typically begins around age 5 or 6 (Figure 1.12). To relieve pressure on working families, especially underprivileged households, more should be done to improve access to quality early childhood education and care. Spending on high-quality preschool and child care is typically the most cost-effective education investment in life (Heckman, 2009; Heckman,

Figure 1.12. **The US lags behind in early education spending**
Cumulated public spending per child in 2009



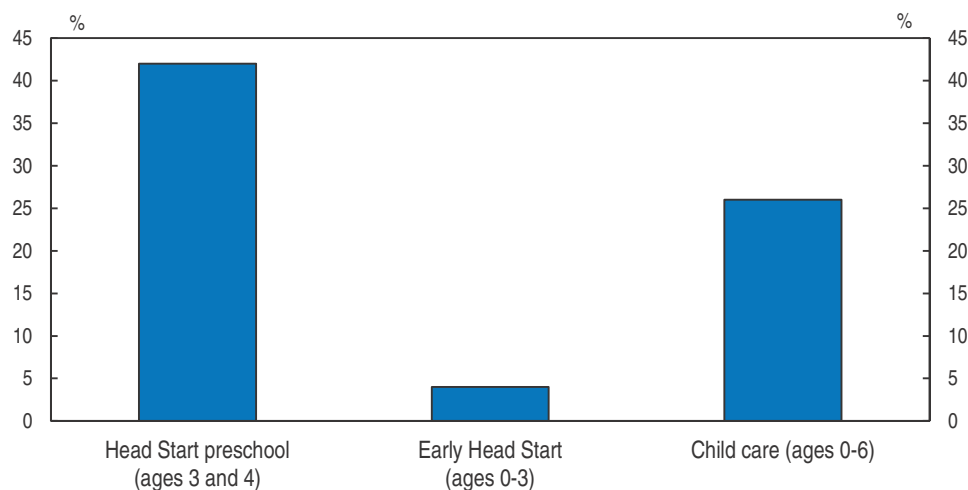
Source: OECD, Family Database.

StatLink  <http://dx.doi.org/10.1787/888933081188>

2013). Such spending will not only provide better education opportunities to more children, it will strengthen their ability to gain from traditional public education and also help parents in employment or wanting to work to balance their breadwinning and caring responsibilities.

Early childhood education is not as well developed in the United States as in other countries. For instance, only 50% of 3-year-old children were enrolled in early childhood education in 2011, compared to 68% on average in OECD countries (OECD, 2013a). Early education is also costlier than in most OECD countries. For instance, costs can go up to 47% of family's monthly income for low-income households, according to data from the US census bureau. Subsidised care options are available, and programmes such as Head Start or Early Head Start targeted to the most disadvantaged are very effective, but they are underfunded and many eligible children are left out (Figure 1.13).

Figure 1.13. Early childhood education is not well developed
Per cent of eligible young children served in federal programmes



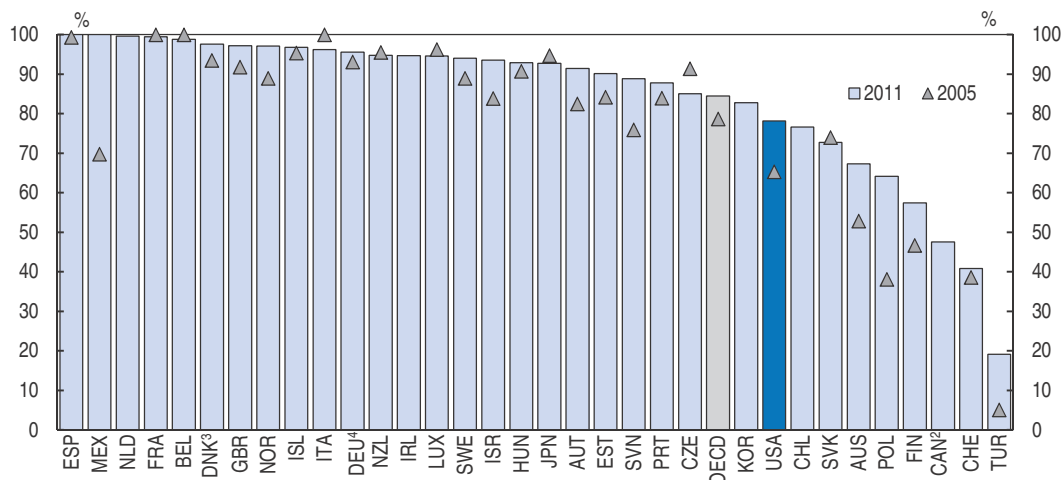
Note: Data for Head Start preschool and Early Head Start refer to 2012. Data for Childcare refers to 2009.

Source: National Women's Law Center calculation of Department of Health and Human Services Head Start Data and American Community Survey Data; Office of the Assistant Secretary for Planning and Evaluation, estimate of Child Care Eligibility and Receipt for Fiscal Year 2009 (2012).

StatLink  <http://dx.doi.org/10.1787/888933081454>


The Administration and Congress are thinking about plans to seek increased access to pre-school education for 4-year-olds over the coming years and to improve quality, which are important steps in the right direction. Public preschool enrolment of four-year-olds rose by 25 percentage points between 1980 and 2011 (Cascio and Schanzenbach, 2013), due to increased subsidisation at the state level; and by 10 percentage points between 2005 and 2011 (Figure 1.14). Participation is lower for children from low and moderate income families (the two bottom quintiles), with only 64% enrolled in early education, compared to 90% of 4-year-olds in families ranked in the top quintile of family income (Barnett and Nores, 2012). Additional funds are thus particularly needed to expand enrolment for more 4-year-olds and 3-year-olds from low and moderate income families. These children can benefit the most from additional public investment, as it is likely that private alternatives for them to state programmes are weaker, given the financial constraints faced by lower-income families. The marginal returns to human capital investment are also likely to be higher for disadvantaged children (Burger, 2010).

Figure 1.14. **Fewer children are enrolled in early childhood and primary education**
Enrolment rates at age 4 (2005, 2011)¹



1. Enrolment rates at low ages should be interpreted with care, mismatches between the date of reference of ages and the date of data collection may lead to overestimations. Underestimation in enrolment rates may be due to uncounted late entrants.
2. Year of reference 2010 instead of 2011. Only includes kindergarten and junior kindergarten students in the public school system.
3. Mandatory classes have been included in ISCED 1 as of 2011.
4. Year of reference 2006 instead of 2005.

Source: OECD (2013), *Education at a Glance 2013: OECD Indicators*. See Annex 3 for notes (www.oecd.org/edu/eag.htm).

StatLink  <http://dx.doi.org/10.1787/888933081473>

There is also a need to boost the quality of existing preschool and childcare programmes if early education is to improve the development of children and preserve their well-being. A large body of research suggests that high-quality early education investments can have high pay-offs improving school outcomes later in life for disadvantaged children and contribute to reducing inequalities (Camilli et al., 2010; Heckman, 2013). There are also potential positive externalities to reap from preschool enrolment through reductions in crime and public assistance that justify public investments in early childhood education (Kilburn and Karoly, 2008). Yet, the early school education experienced by many children is not of sufficiently high quality to improve their development and in some cases it may even be harmful to children well-being.

Research examining preschool and childcare programmes across different states shows that many but not all of them meet licensing requirements, but also that in many cases requirements are fairly low, focusing on very basic safety and health standards (Zellman and Karoly, 2012, National Association of Child Care Resource and Referral Agencies, 2013). Standards are monitored in most states, but as many as nine states do not require any type of inspection at least once a year (National Association of Child Care Resource and Referral Agencies, 2013). Moreover, programmes do not always provide stimulating learning environments as educators often lack the required skills and competencies (Early et al., 2005). For example, recommended benchmarks for adult child ratios and group sizes, which are basic ingredients for good pre-school education, are not widely met in most states (Schmit et al., 2013). Some publicly funded programmes, such as Head Start and Early Head start, must adhere to higher quality standards and they are extremely effective (Cascio and Schanzenbach, 2013), but regulations for publicly funded programmes vary by funding source and still fall short of the benchmarks for high quality

programmes (Zellman and Karoly, 2012). For instance, most public child care assistance benefiting infants and toddlers is channelled through the Child Care and Development Block Grant, which allocates funds to states for child care with little or no requirements on the quality of such care, including basic health and safety requirements (National Association of Child Care Resource and Referral Agencies, 2013).

Under the Administration's Preschool for All initiative, States would need to meet quality standards to receive federal funds, including requiring preschool teachers to have a bachelor degree and ongoing professional development, as well as requiring higher preschool staff salaries. Similar reforms should be made to improve the quality of child care provided with federal funding under the Child Care and Development Fund, notably meeting federally defined minimum guidelines on health and safety for child care. In addition to staff quality, working conditions and remuneration could be addressed to incentivise competent staff to work and remain working in the Early Childhood Education Center (ECEC) sector. States' efforts to develop approaches to measure and improve quality, such as the state and local quality rating and improvement systems (Zellman and Caroly, 2012), should also be supported. Expanding effective targeted interventions, such as Head Start, Early Head Start and evidence based home visiting programmes, to more disadvantaged children, while costly, is also very important. These can help to offset the negative effects of poor socio-economic backgrounds on children and can encourage greater parental engagement among low-income low-educated parents.

Recommendations to improve the well-being of Americans

Job quality

- Broaden eligibility of the earned income tax credit by strengthening the credit for childless low-income workers and expanding it to younger workers.
- Improve the effectiveness of the EITC through appropriate reforms in the minimum wage.
- Work with employers to further strengthen the role of health policy in preventing the negative health effects of job strain and work-life conflicts, notably on mental health, by strengthening prevention, early intervention and improving awareness.

Family paid leave and flexible workplaces

- Improve support for parents who need to take off from work for family reasons by expanding access to paid family leave nationally.
- Encourage more employers to adopt family-friendly policies by increasing awareness of the possible benefits and helping states develop and implement right-to-ask policies.

Early education and childcare

- Improve access to quality preschool for underserved low and moderate income children.
- Ensure that childcare and preschool programmes deliver high quality for all children by defining and enforcing minimum quality benchmarks for preschool and childcare.
- Expand Head Start, Early Head Start and effective home visiting programmes to more disadvantaged children.

Bibliography

- Allen, R. et al. (2000), "Consequences Associated with Work-Family Conflict: A Review and Agenda for Future Research", *Journal of Occupational Health Psychology*, Vol. 5(2), pp. 278-308.
- Appelbaum, E. and R. Milkman (2011), "Leaves that Pay: Employer and Worker Experiences with Paid Family Leave in California", mimeo.
- Bassanini, A. and D. Venn (2007), "Assessing the Impact of Labour Market Policies on Productivity: A Difference-in-Differences Approach", *OECD Social, Employment and Migration Working Papers*, No. 54, OECD Publishing, Paris, <http://dx.doi.org/10.1787/122873667103>.
- Barnay, T. (2014), "Health, Work and Working Conditions; A Review of the European Economic Literature", *OECD Working Paper*, OECD Publishing, Paris, forthcoming.
- Barnett, W. and M. Nores (2012), "Estimated Participation and Hours in Early Care and Education by Type of Arrangement and Income at Ages 2 to 4 in 2010", National Institute for Early Education and Research, New Brunswick.
- Bianchi, S.M. (2010), *Family Change and Time Allocation in American Families*, Alfred Sloan Foundation.
- Bianchi, S.M. and S. Raley (2005), *Time Allocation in Working Families*, in S.M. Bianchi, L.M. Casper and R.B. King (eds.), *Work, Family, Health, and Well-Being*, Lawrence Erlbaum and Associates, Mahwah, NJ.
- Board of Governors (2010), *Commencement Address: The Economics of Happiness*, Remarks by Ben S. Bernanke, at the University of South Carolina.
- Bureau of Labor Statistics (2012), "National Compensation Survey: Employee Benefits in the United States", US Department of Labour, March 2012.
- Burger, K. (2010), "How Does Early Childhood Education Care and Education Affect Cognitive Development? An International Review of the Effects of Early Interventions for Children From Different Social Backgrounds", *Early Childhood Research Quarterly*, Vol. 25(2), pp. 140-165.
- Burke, R. and C. Cooper (2008), *The Long Work Hours Culture: Causes, Consequences and Choices*, Emerald Publishers, United Kingdom.
- Caldera Sánchez, A. and C. Tassot (2014), "An Exploration of the Determinants of the Subjective Wellbeing of Americans During the Great Recession", *OECD Working Paper*, OECD Publishing, Paris, forthcoming.
- Camilli, G. et al. (2010), "Meta-Analysis of the Effects of Early Education Interventions on Cognitive and Social Development", *Teachers College Record*, Vol. 112(3), pp. 579-620.
- Capra, F. and H. Henderson (2009), *Outside Insights: Qualitative Growth*, Tomorrows Company.
- Carlson, M. and S. McLanahan (2010), "Fathers in Fragile Families", in M.E. Lamb (ed.), *The Role of the Father in Child Development* (5th ed.), Wiley and Sons, Hoboken, NJ, pp. 241-269.
- Cascio, E. and D. Whitmore Schanzenbach (2013), "The Impacts of Expanding Access to High-Quality Preschool Education", *NBER Working Paper*, No. 19735.
- CBO (2014), "The Effects of a Minimum-Wage Increase on Employment and Family Income", Congressional Budget Office.
- CEA (2010), *Work-Life Balance and the Economics of Workplace Flexibility*, Executive Office of the President, Council of Economic Advisers.
- CEA (2014), "The Economic Case for Lifting the Minimum Wage", Council of Economic Advisers.
- Chetty, R., J. Fridman and E. Saez (2013), "Using Differences in Knowledge across Neighborhoods to Uncover the Impacts of the EITC on Earnings", *American Economic Review* 2013, Vol. 103(7), pp. 2683-2721.
- Daly, L. and S. Posner (2011), *Beyond GDP: New Measures for a New Economy*, Demos, New York.
- Darden, M. (2014), "Workplace Stress in the United States: Issues and Policies", *OECD Working Paper*, OECD Publishing, Paris, forthcoming.
- Dembe, A., R. Delbos and J. Erickson (2008), "The Effect of Occupation and Industry on the Injury Risks from Demanding Work Schedules", *Journal of Occupational and Environmental Medicine*, Vol. 50(10), p. 1185.
- Doucouliaos, H. and T. Stanley (2009), "Publication Selection Bias in Minimum-Wage Research? A Meta-Regression Analysis", *British Journal of Industrial Relations*, Vol. 47, No. 2, pp. 406-428.

- Dube, A., T. Lester and M. Reich (2010), "Minimum Wage Effects Across State Borders: Estimates Using Contiguous Counties", *Review of Economics and Statistics*, Vol. 92, No. 4, pp. 945-964.
- Early, D., O. Barbarin, D. Bryant, M. Burchinal, F. Chang, R. Clifford, G. Crawford, W. Weaver, C. Howes, S. Ritchie, M. Kraft-Sayre, R. Pianta and W. Barnett (2005), "Pre-Kindergarten in Eleven States: NCEDL's Multi-State Study of Pre-Kindergarten and Study of State-Wide Early Education Programs (SWEEP)", *NCEDL Working Paper*.
- Edelman, P. et al. (2009), "Expanding the EITC to Help More Low-Wage Workers", Georgetown Center on Poverty, Inequality and Public Policy.
- Eissa, N. and H. Hoynes (2004), "Taxes and the Labour Market Participation of Married Couples: The Earned Income Tax Credit", *Journal of Public Economics*, No. 88, pp. 1931-58.
- Finkelstein, A. et al. (2012), "The Oregon Health Insurance Experiment: Evidence from the First Year", *Quarterly Journal of Economics*, Vol. 127(3), pp. 1057-1106.
- Finkelstein, A. et al. (2013), "The Oregon Health Insurance Experiment: Evidence from the First Year", *New England Journal of Medicine*, Vol. 368(18), pp. 1713-1722.
- Galinsky, E., K. Aumann and J. Bond (2011), "Times are changing: Gender and Generation at Work and at Home", Families and Work Institute.
- Gauthier, A., T. Smeeding and F. Furstenberg (2004), "Are Parents Investing Less Time in Children? Trends in Selected Industrialized Countries", *Population and Development Review*, Vol. 30(4), pp. 647-672.
- Gilboa, S. et al. (2008), "A Meta-Analysis of Work Demand Stressors and Job Performance: Examining main and moderating effects", *Personnel Psychology*, No. 61, pp. 227-281.
- Goetzel et al. (2004), "Health, Absence, Disability, and Presenteeism Cost Estimates of Certain Physical and Mental Health Conditions Affecting US Employers", *Journal of Occupation and Environmental Medicine*, pp. 398-412, www.ncbi.nlm.nih.gov/pubmed/15076658.
- Goldin, C. (2014), "A Grand Gender Convergence: Its Last Chapter", *American Economic Review*, forthcoming.
- Goldin, C. and L. Katz (2011), "The Cost of Workplace Flexibility for High-Powered Professionals", *The Annals of the American Academy of Political and Social Science*, Vol. 638(1), pp. 45-67.
- Heckman, J. (2009), "The Case for Investing in Disadvantaged Young Children", *Big Ideas for Children: Investing in our Nation's Future*, Washington: First Focus, p. 49.
- Heckman, J. (2013), *Giving Kids a Fair Chance*, Boston Review Books.
- Heim, B. (2006), "The Impact of the Earned Income Tax Credit on the Labour Supply of Married Couples: Structural Estimation and Business Cycle Interactions", *Working Paper*, US Department of the Treasury, Washington, DC.
- Holzer, H. (2012), "Raising Job Quality and Skills for American Workers: Creating More-Effective Education and Workforce Development Systems in the States", *IZA Policy Paper*, No. 42.
- Holz-Eakin (2013), "Workplace Policy Towards Overtime Workers", AAF Research.
- Houser, L. and T. Vartanian (2012), "Policy Matters: Public Policy, Paid Leave for New Parents, and Economic Security for US Workers", Center for Women and Work at Rutgers, The State University of New Jersey.
- Huerta, M. et al. (2012), "Father's Leave, Father's Involvement and Child Development: Are They Related? Evidence from four OECD countries", *OECD Social, Employment and Migration Working Papers*, No. 140, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5k4dlw9w6czq-en>.
- ILO (1998), *Maternity Protection at Work*, International Labour Organization.
- ILO (2010), "Maternity at Work: A Review of National Legislation", *Findings from the ILO Database of Conditions of Work and Employment Laws*, International Labour Organization.
- ILO (2012), "The Influence of Working Time arrangements on Work-Life Integration or 'Balance': A Review of International Evidence", International Labour Organization.
- IWPR (2013), "Maternity, Paternity and Adoption Leave in the United States", *Briefing Paper*, May 2013, Institute for Women's Policy Research.
- Jacobs, J. and K. Gerson (2004), *The Time Divide: Work, Family and Gender Inequality*, Harvard University Press, Cambridge.

- Kamerman, S. and J. Waldfogel (2010), "United States", in P. Moss (ed.), *International Review of Leave Policies and Related Research 2010*, Employment Relations Research Series, No. 115, Department for Business and Skills, London, pp. 240-243.
- Kilburn, R. and L. Karoly (2008), "The Economics of Early Childhood Policy: What the Dismal Science Has to Say about Investing in Children", *Rand Labor and Population, Occasional Paper*.
- Klerman, J., K. Daley and A. Pozniak (2013), "Family and Medical Leave in 2012", *Technical Report*, US Department of Labor, Washington, DC.
- Krueger, A. and A. Mueller (2012), "Time Use, Emotional Well-being and Unemployment: Evidence from Longitudinal data", *American Economic Review*, Vol. 102(3), pp. 594-99.
- Landefeld, S. et al. (2010), "GDP and Beyond: Measuring Economic Progress and Sustainability", *Survey of Current Business*, April 2010.
- Madrian, B. (1994), "Employer-Based Health Insurance and Job Mobility: Is there evidence of Job-Lock?", *Quarterly Journal of Economics*, Vol. 109(1), pp. 27-54.
- McGuinness, F. and H. Russell (2013), "Work-Family Conflict and Economic Change", in D. Gallie (ed.), *Economic Crisis, Quality of Work and Social Integration, The European Experience*, Oxford University, Oxford.
- Meyer, B. (2010), "The Effects of the Earned Income Tax Credit and Recent Reforms", in *Tax Policy and the Economy*, Vol. 24, pp. 153-80, Cambridge, MA: MIT Press.
- Mishel, L. et al. (2012), *The State of Working America*, An Economic Policy Institute Book.
- NACCRA (2013), "We Can Do Better, 2013 Update: NACCRRRA's Ranking of State Child Care Center Regulations and Oversight", National Association of Child Care Resource and Referral Agencies, Washington, DC.
- Neumark, D., I. Salas and W. Wascher (2013), "Revisiting the Minimum Wage-Employment Debate: Throwing out the Baby with the Bathwater?", *NBER Working Paper*, No. 18681.
- OECD (2007), *Babies and Bosses – Reconciling work and family life: A Synthesis of Findings for OECD Countries*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264032477-en>.
- OECD (2009), *OECD Employment Outlook 2009: Tackling the Jobs Crisis*, OECD Publishing, Paris, http://dx.doi.org/10.1787/empl_outlook-2009-en.
- OECD (2010), *Sickness, Disability and Work: Breaking the Barriers – A Synthesis of Findings across OECD Countries*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264088856-en>.
- OECD (2011a), *How's Life? Measuring Well-being*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264121164-en>.
- OECD (2011b), *Doing Better for Families*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264098732-en>.
- OECD (2013a), *Education at a Glance 2013: OECD Indicators*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/eag-2013-en>.
- OECD (2013b), *How's Life? 2013: Measuring Well-being*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264201392-en>.
- OECD (2013c), *Time for the U.S. to Reskill? What the Survey of Adult Skills Says*, OECD Skills Studies, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264204904-en>.
- OECD (2014a), "How Good is Your Job? A Framework for Measuring and Assessing Job Quality", OECD Publishing, Paris, forthcoming.
- OECD (2014b), *Tackling High Inequalities: Creating Opportunities for All*, OECD Publishing, Paris.
- Parker K. and W. Wang (2013), "Modern Parenthood: Roles of Moms and Dads as they Balance Work and Family", Pew Research Center.
- Rath, T. and J. Harter (2010), *The Economics of Wellbeing*, Gallup Press.
- Refining Progress (2007), "Genuine Progress Indicator", www.rprogress.org.
- Röhn, O. et al. (2013), "Austria's Well-being Goes Beyond GDP", *OECD Economics Department Working Papers*, No. 1079, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5k422133hjnv-en>.
- Sacks, D. et al. (2012), "The New Stylized Facts About Income and Subjective Well-Being", *Emotion*, Vol. 12, No. 6, pp. 1181-1187.
- Sahwhill, I. and Q. Karpilow (2013), "Strategies for Assisting Low Income Families", *Brookings Paper*.

- Schmit, S. et al. (2013), "Investing in Young Children: a Fact Sheet on Early Care and Education Participation, Access and Quality", National Center for Children in Poverty, Mailman School of Public Health, Columbia University.
- SECO (2007), *KMU-Handbuch "Beruf und Familie" – Massnahmen zur Vereinbarkeit von Beruf und Familie in kleinen und mittleren Unternehmen*, Eidgenössisches Volkswirtschaftsdepartement EVD, Staatssekretariat für Wirtschaft, SECO, Bern, www.seco.admin.ch.
- Shrestha, L. (2006), "Life Expectancy in the United States", *CRS Report RL32792*, US Congressional Research Service, August, Washington, DC.
- Shriver, M. (2014), "The Shriver Report: A Woman's Nation Pushes back from the Brink", Center for American Progress.
- Stevenson, B. and J. Wolfers (2013), "Subjective Well-Being and Income: Is There Any Evidence of Satiation?", *American Economic Review*, American Economic Association, Vol. 103(3), pp. 598-604.
- Stiglitz, J., A. Sen and J. Fitoussi (2009), *Mismeasuring Our Lives: Why GDP Doesn't Add Up*, the report by the Commission on the Measurement of Economic Performance and Social Progress, The New Press.
- Thévenon, O. and A. Solaz (2013), "Labour Market Effects of Parental Leave Policies in OECD Countries", *OECD Social, Employment and Migration Working Papers*, No. 141, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5k8xb6hw1wjf-en>.
- TIGTA (2013), "The Internal Revenue Service is Not in Compliance with Executive Order 13520 to Reduce Improper Payments", Treasury Inspector General for Tax Administration.
- US Department of Labor, Wage and Hour Division (2008), *Fact Sheet No. 17: Exemption for Executive, Administrative, Professional Computer and Outside Sales Employees Under the Fair Labor Standards Act (FLSA)*.
- Vrijkotte, T., L. van Doornen and E. de Geus (2000), "Effects of Work Stress on Ambulatory Blood Pressure, Heart Rate, and Heart Rate Variability", *Hypertension*, Vol. 35, pp. 880-886.
- White House (2009), President Obama's Inaugural Address, 18 January 2009.
- Wilson Banwell (2006), "Under Pressure: Implications of Work-Life Balance and Job Stress", Human Solutions Report, 2006-2007.
- Wolfers, J. (2003), "Is Business Cycle Volatility Costly? Evidence from Surveys of Subjective Wellbeing", *NBER Working Paper*, No. 9619.
- Wolfson, P. and D. Belman (2013), "What Does the Minimum Wage Do?", Upjohn Institute for Employment Research, Kalamazoo, MI.
- Zellman, G. and L. Karoly (2012), "Moving to Outcomes: Approaches to Incorporating Child Assessments into States Early Childhood Quality Rating and Improvement Systems", *Education and Rand Labor and Population, Occasional Paper*.

Chapter 2

Making the best of new energy resources

Since around 2007, the country has been enjoying an “energy renaissance” thanks to its abundant stocks of shale oil and gas. The resurgence in oil and gas production is beginning to create discernible economic impacts and has changed the landscape for natural gas prices in the United States, boosting competitiveness. In order to reap the benefits fully, significant investment is needed. Federal and state governments capture some of the resource rents, but there are potential opportunities to increase taxation and use the revenues to support future well-being. Taxing natural resource rents with profit taxes can be less distortionary than other forms of taxation, though only one state uses this form of tax. Production of shale resources, like other forms of resource extraction, poses a number of challenges for the environment. Respecting demands on water resources requires adequate water rights are in place while state and federal regulators need to monitor the environmental impact of hydraulic fracturing closely and strengthen regulations as needed. Natural gas is a potential “bridge fuel” towards a lower carbon economy, helping to reduce emissions by leading to a substitution away from coal. Flanking measures are desirable to counter natural gas hindering renewables and low prices stymieing innovation.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

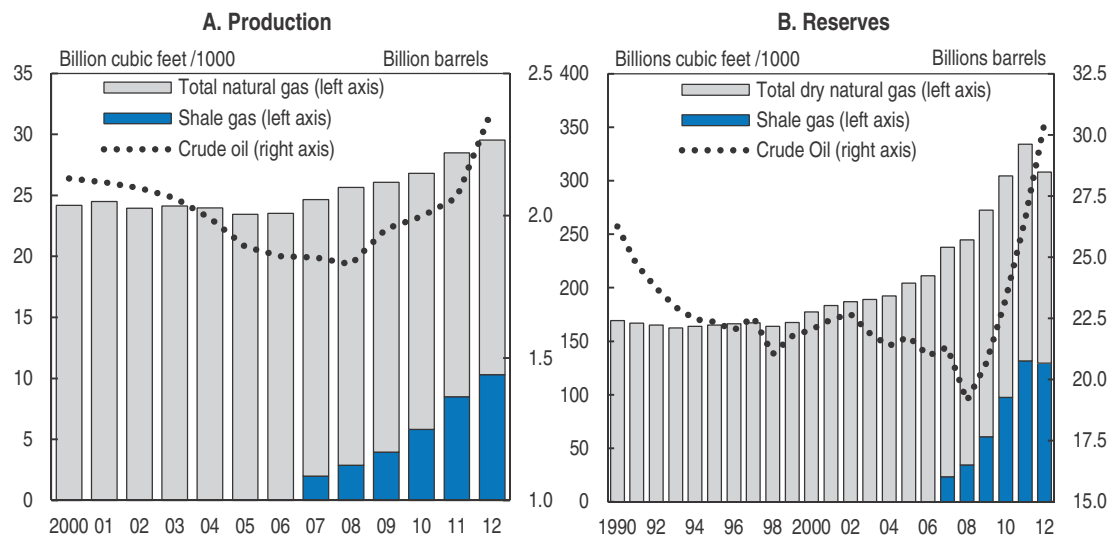
The United States is endowed with an abundance of natural capital – the natural resource inputs and environmental services for economic production – and economic growth has been punctuated by periods of their rapid exploitation, such as for gold and other metal ores, minerals and coal, oil and gas. Since around 2007, the country has been enjoying an “energy renaissance” thanks to its abundant stocks of shale oil and gas being made accessible by the combination of hydraulic fracturing and horizontal drilling technologies. The renaissance has revived production of oil and natural gas and is creating economic benefits. At the same time, exploiting natural capital raises issues about how to make sure that the environmental impacts and safety concerns are taken into consideration (i.e. internalise associated environmental externalities) and ensure that longer-term sustainability, both of wealth and the environment, is taken into consideration. This chapter, examining the recent upswing in oil and gas production, considers the policies that help capture the full economic and environmental benefits while addressing externalities and longer-term sustainability.

The next section describes the resource endowment in the United States and how shale oil and gas have changed the picture for the energy sector. The next section discusses the economic benefits which may emerge as a result of increased oil and gas production. The following section assesses how the rents from the sector are being distributed and how taxation of the sector is implemented. This is followed by a discussion of the local impacts of hydraulic fracturing and the regulatory challenge they create. The final section then discusses the contribution natural gas could make to climate change mitigation and the challenges it may pose moving towards an even lower carbon economy.


The United States is well endowed with natural resources

Natural capital represents a relatively small share of the overall wealth in the United States, which is dominated by intangibles or human (and health) capital (Arrow et al., 2012). However, on a per capita basis, calculations for the early 2000s still rank the United States 11th in the world according to the abundance of natural capital and 15th in respect to sub-soil mineral resources (World Bank, 2006). Only a few OECD countries have large shares of natural resources as a share of total wealth, which in the case of Norway arises due to their ample off-shore hydrocarbon reserves. Japan, on the other hand, has very few natural resources and its wealth is derived from human capital and produced (physical) capital.

Following the successful deployment of new technologies for advanced drilling, the Energy Information Administration markedly increased its estimates of oil and gas reserves (Figure 2.1). Shale gas proved reserves – those reserves with reasonable certainty to be recoverable from known reservoirs under existing economic and operating conditions – have risen more than fivefold between 2007 and 2011 and now account for 40% of total gas reserves in the United States. In the case of oil, shale oil (often referred to as “tight oil”) proved reserves have also risen, though less spectacularly, and these deposits

Figure 2.1. **Production and reserves of oil and natural gas are rising**

Source: US Energy Information Administration (EIA) and the US Bureau of Labor Statistics.

StatLink  <http://dx.doi.org/10.1787/888933081492>

now account for around 10% of total oil proved reserves. Forecasts suggest that production of shale gas will continue to grow strongly till at least 2040 when it will account for one half of natural gas produced in the United States (EIA, 2013). President Obama in his 2012 State of the Union address noted that recoverable resources may last as long as 100 years at current production levels. At present, not all recoverable resources would be commercially viable to extract, but in the longer term as energy prices rise and/or technological innovation reduce extraction costs a greater share of these resources could be extracted. The picture for production of shale oil is similar, but with total oil production peaking before 2030 and then declining.

Natural capital in the United States has been boosted by rises in estimates of proved reserves of shale oil and shale gas. Using a methodology developed by the World Bank to estimate natural wealth gives some indication of the potential changes arising from these developments. By this measure, oil and gas wealth in the United States grew from around 16% of GNI in 2000 to over 30% of GNI in 2008, just when the shale boom was beginning to take off (Table 2.1). Assuming the boost to reserves extends the resource life, the expansion of shale oil and shale oil production could lift wealth derived from oil and gas substantially. While more recent information on production costs is unavailable, using the latest available figure to estimate the rents suggests that the natural wealth due to gas has fallen somewhat, partly as a result of the falling natural gas prices in the United States (see below), whereas the wealth due to crude oil rose further.

The impact of shale oil and gas development has seen the gradual fall in crude oil production reversed and the production of natural gas pick up. Between 2008 – when production hit its recent low – and 2013 crude oil production has surged, rising by almost 50%. Over the same period, the production of natural gas has risen almost 20%, with shale gas production more than tripling and offsetting declines in conventional natural gas production from other sources.

Table 2.1. **Estimates of oil and gas wealth**

	2000	2008	2008	2012
Assumed resource life	20	20	40	20
Year of estimated production costs	2000	2008	2008	2008
Natural gas				
Wealth as % of GNI	9.5	16.9	30.8	14.3
Wealth per capita, current USD	3 061	7 977	14 566	6 592
Crude oil				
Wealth as % of GNI	6.9	16.1	29.7	24.3
Wealth per capita, current USD	2 229	7 624	14 055	11 305

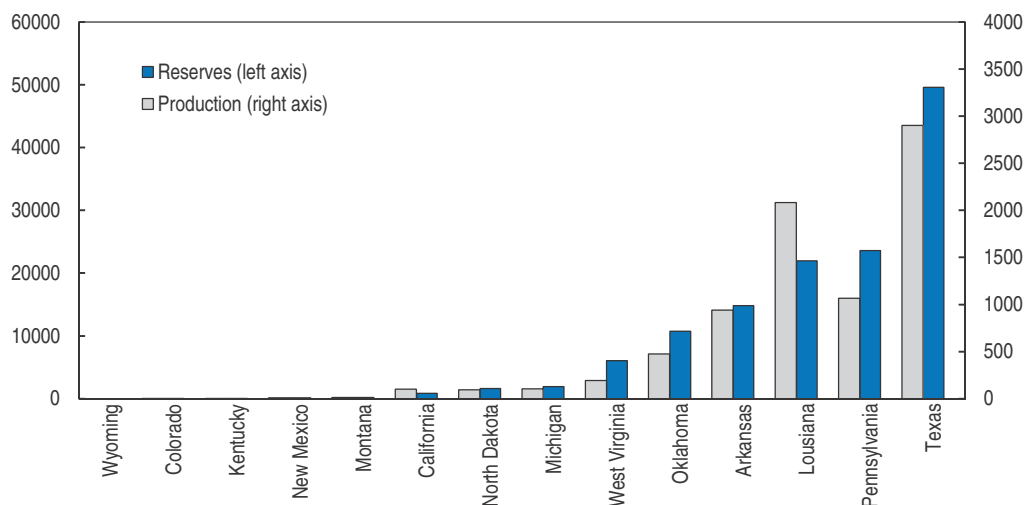
Note: Estimates of oil and gas wealth are based on the methodology used in World Bank (2006). This methodology makes a number of simplifying assumptions to calculate the resource rent. These include setting the assumed resource life of the deposit and estimating of production costs for oil and gas. The calculation of wealth is then based on these parameters and production levels. The table in the first two columns reproduces the estimates of oil and gas wealth for 2000 and 2008 using this methodology. In order to explore the possible impact of more abundant oil and gas resources, the third column reports estimates of wealth when the assumed resource life if doubled. The impact of price changes between 2008 and 2012 is reported in the fourth column.

Source: Calculations based on World Bank, EIA, Census Bureau and BEA data.

The oil and gas boom has boosted the fortunes of a number of states and invigorated companies working in the sector. The distribution of shale gas deposits across the country is quite widespread, though the proved reserves are predominantly located in a handful of states, which is also where large-scale shale gas production (these areas are often called “plays”) is located (Figure 2.2). The shale oil deposits are predominately located in Texas, North and South Dakota, Montana, Colorado, Kansas, Nebraska and Wyoming. Whilst energy stocks have tracked the recovery of stock market indices following the crisis, the relatively small scale of hydraulic fracturing wells has led to a substantial inflow of independent companies into drilling and supporting services. As a consequence, the major integrated energy companies have had a less dominant role in the energy renaissance as it got underway, but have increasingly moved into this area.

Figure 2.2. **Shale gas reserves and production are concentrated in a few states**

Billion cubic feet, reserves 2011, production 2012



Source: Energy Information Administration.

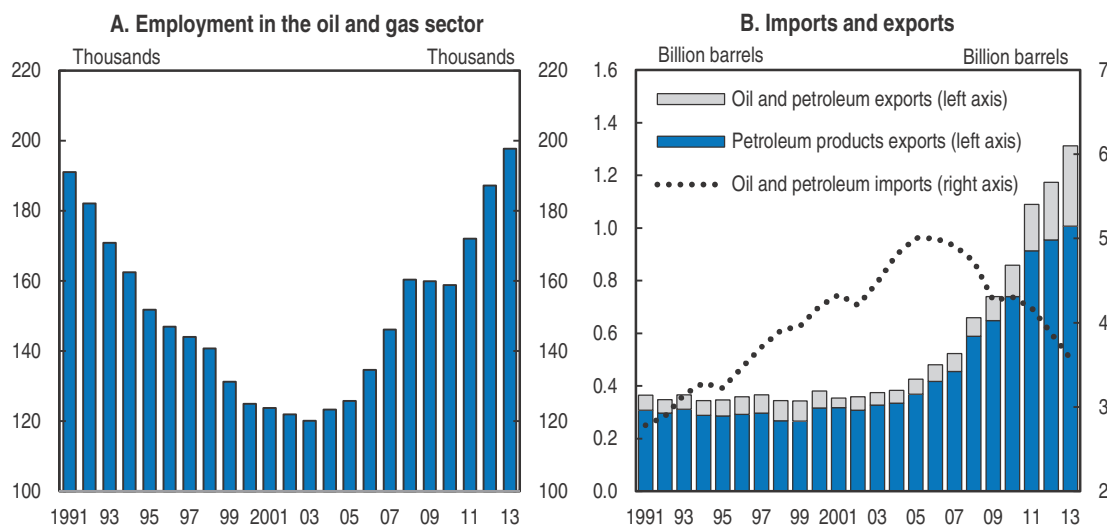
StatLink  <http://dx.doi.org/10.1787/888933081511>

Capturing the economic benefits


Substantial economic benefits are beginning to arise from hydraulic fracturing

The resurgence in US oil and gas production has already created discernible economic impacts, boosting employment in the sector and exports of natural gas and (particularly) refined products (Figure 2.3). Other economic benefits are likely to arise as new production serves as a cushion to price volatility. The direct effects of the oil and gas mining sector on growth have been relatively modest, boosting GDP growth by on average by around 0.15 percentage points since the pick-up in energy production began in 2007. However, BEA data on value-added of the oil and gas mining industry show that the sector has picked up dramatically in 2011 and 2012 when the real growth rate of value added in the oil and gas mining sector rose to 7% and then 18%, accounting for 0.23 and 0.35 percentage points of overall GDP growth during these years, respectively. In addition, there are indirect upstream and downstream effects on GDP that are not included in these estimates. The boom in shale oil and gas has contributed to strong investment in structures in the oil and gas sector, with the growth rate in investment recording double digit rates and averaging 18% annual growth between 2010 and 2012. Employment in oil and gas mining remains relatively small, but rising strongly during the recovery from the crisis (Figure 2.3). Including support activities in the mining sector suggests that employment has been boosted by 300 000 between the nadir in employment in 2003 and 2013.

Figure 2.3. **The shale boom is boosting employment and net exports**



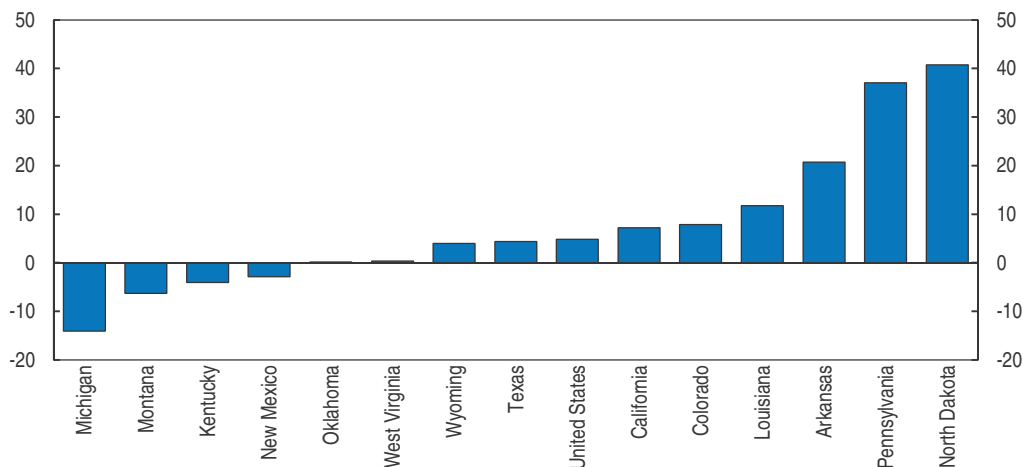
Source: US Energy Information Administration (EIA) and the US Bureau of Labor Statistics.

StatLink  <http://dx.doi.org/10.1787/888933081530>

In the states with the largest shale gas production, the growth rate of the oil and gas mining sector has in some cases been spectacular, with Pennsylvania and North Dakota experiencing annual growth rates in the sector of over 30%, albeit from low initial levels (Figure 2.4). The effects are discernible in wage and employment developments in some states. The impact of the resource boom is especially apparent on wage growth. For example, according to BLS data, average weekly earnings in North Dakota are rising at a 7% rate since 2011, compared with the national average of around 2%. BLS data also show that gains in mining sector employment have contributed to sizable employment gains in a number of regions.

Figure 2.4. **Growth in the oil and gas mining sectors is fast in some states**

Average growth rate 2007 to 2011



Source: Bureau of Economic Analysis.

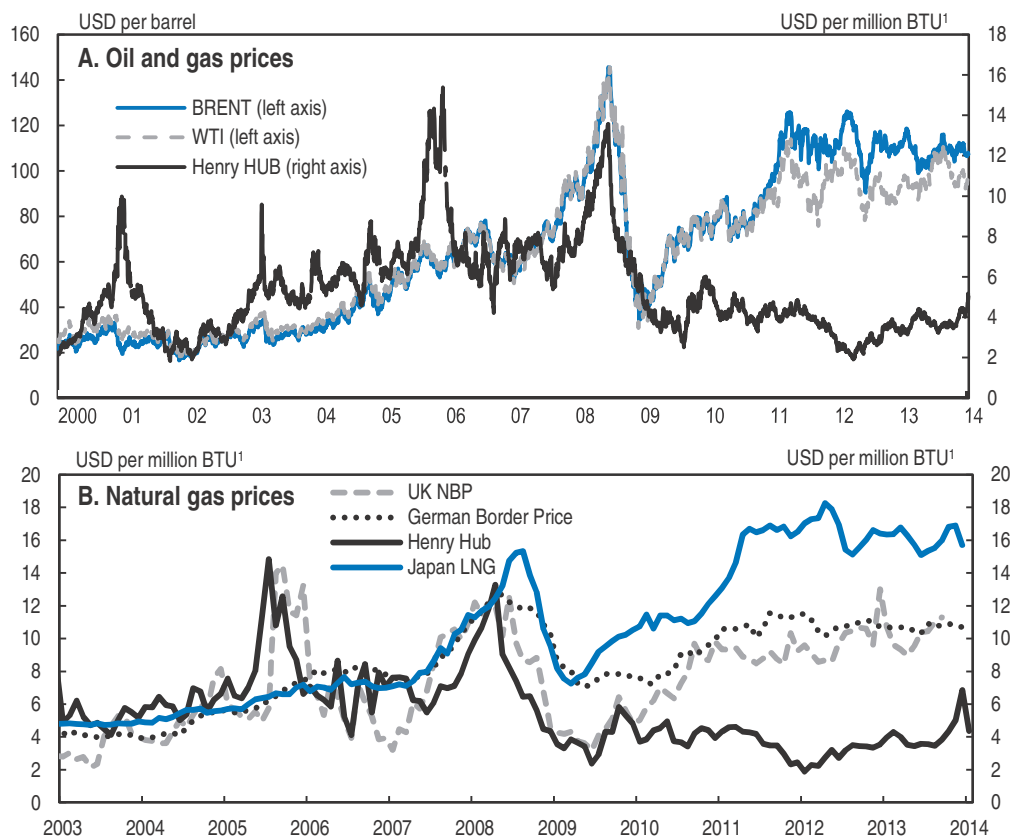
StatLink  <http://dx.doi.org/10.1787/888933081549>

The oil and gas boom has depressed domestic energy prices

The shale gas and oil boom has changed the landscape for energy prices in the United States. The relationships between international oil prices (Brent), domestic oil prices (WTI) and natural gas prices (Henry Hub) have weakened, with the tendency for these prices to move together becoming weaker after mid-2008, largely coinciding with the largely unanticipated rapid pick up in shale oil and gas production (Figure 2.5). The decoupling of natural gas from prices in Europe and Asia is particularly pronounced. The price of natural gas fell to as low as around one-quarter of natural gas prices in Europe and even less in the Asian market before rebounding somewhat. The low price of natural gas promoted a switch in exploration and production away from shale gas and towards shale oil. Lower domestic natural gas prices have supported natural gas exports and are boosting the potential competitiveness for natural gas intensive industry by reducing feedstock (mainly ethylene) prices, whereas other sectors benefit from cheaper energy prices. Given liquefaction, transportation and regasification costs, the wedge between domestic and international natural gas prices is likely to be persistent. Export of natural gas to countries without free-trade agreements with the United States requires prior approval from the Department of Energy, for which there is an established authorisation process. The Administration should ensure that energy exports are promptly approved. Limited export-oriented infrastructure also currently constrains natural gas exports. Although more than 9 billion cubic feet per day of export facilities have been granted conditional permits from the Department of Energy and roughly 2 billion cubic feet per day have received final permits, LNG export facilities are massive and require years to construct. With the prospect of lower domestic energy prices, investment in pipelines and other transportation infrastructure, which are undertaken by the private sector, will be important to ensure the economy can reap the full benefits.


In the oil sector, legal restrictions on crude oil exports in place since the 1970s do not prevent the exports of refined petroleum products. However, foreign sales may be limited to the extent that refining capacity and transportation infrastructure are insufficient to handle the available supply. The Administration is considering options under current law to allow exports of crude oil. Another approach would be to abolish the prohibition of crude oil exports altogether.

Figure 2.5. Oil and gas prices have diverged



1. BTU (British Thermal Units)

Source: Bloomberg and International Energy Agency.

StatLink  <http://dx.doi.org/10.1787/888933081568>

Other sectors will benefit from the expansion of hydraulic fracturing through input-output linkages. The demand from the development of the shale gas and oil sector to other sectors is likely to be relatively weak. On the other hand lower energy costs can raise the competitiveness in energy intensive sectors, augmenting the impact of relatively modest growth in unit labour costs (Celasun et al., 2014). The impacts on energy-intensive sectors, such as chemicals, are currently limited (Goldman Sachs, 2013). To some extent, the lack of a consistent picture in industries most likely to benefit from low domestic energy prices is due to their capital-intensive nature. As new capacity takes time to construct the full impact on competitiveness will only become apparent over time. That said, recent data suggests that the low domestic energy prices are having an impact on exports. For example, Spencer et al. (2014) note that net exports in energy-intensive sectors more than doubled in value between 2006 and 2012 to USD 27 billion, though still only accounting for a small share of overall trade. While the effects outside the oil and gas mining sector have been relatively small so far, the potential for larger effects nonetheless exists (McKinsey, 2013).

In order to reap the benefits fully, significant investment is required. This includes investments in hydraulic fracturing and drilling itself, pipelines and other transportation infrastructure, reorienting import terminals to export terminals and the expansion of energy-intensive industries that are likely to benefit from lower prices. Given the

significant sunk costs and irreversibility associated with these investments, measures that reduce uncertainty support the development of transportation and associated infrastructure. In this context, a stable policy regime, including for climate change (see below), acquires some importance. As discussed below, the environmental impact of hydraulic fracturing is not well understood, which creates uncertainty as to the likely regulatory response. In these circumstances, companies may adopt a wait-and-see strategy and delay investment while environmental agencies develop their regulations. The regulatory approach to the development of natural resources is likely to vary considerably across states, covering environmental standards as well as permitting and licensing. Rahm (2011) notes that the development of mineral rights in some states, such as Texas, is comparatively straightforward whereas in others areas, such as New York state and a number of localities, development is explicitly prohibited. The federal authorities become important regulators when resource development requires interstate transport, with pipelines requiring the approval from the Federal Energy Regulatory Commission.

Who is capturing the benefits?

The boom in oil and gas production is having significant effects in the states where the deposits are located. This raises two related issues. The first concerns how the gains from oil and gas exploitation are shared. The second is what happens after the oil and gas deposits are exhausted. In this context, governments by capturing some of the resource rent can address how to adjust once the resource boom has run its course. This could take the form of investing in education, including community colleges to help workers become more adaptable, funding research, financing productive infrastructure provision and establishing endowment funds and putting government finances on a better footing by paying down debt. In some senses, due to the fungibility of money, ensuring that policy avoids squandering the revenues is key to securing longer-term welfare.

Natural resources confer natural rents, which is roughly the difference between the price at which the resource can be sold less the costs of exploitation and extraction or more formally the opportunity cost of holding the resource underground. Policy settings are important in determining which groups benefit most from the exploitation of natural resources, including future generations who stand to lose unless provisions ensure they also benefit.

In competitive markets, the benefits of resource exploitation are shared among several parties. First, landowners benefit from owning the mineral rights through lease payments for their exploitation. Second, new gas and oil production has pushed down energy prices, particularly gas prices, benefitting consumers. In the oil sector, legal restrictions on crude oil exports in place since the 1970s do not prevent the exports of refined petroleum products. However, foreign sales may be limited to the extent that refining capacity and transportation infrastructure is insufficient to handle the available supply. For example, some refiners are better adapted to using heavier crude oil than the light oil typically produced by hydraulic fracturing. In this case, some of the possible resource rent obtainable for oil producers through exporting would be sacrificed were domestic light oil production to rise to the point where it exceeds domestic refiners' ability to easily absorb it. The Administration is considering options under current law to allow exports of crude oil. Another approach would be to abolish the prohibition of crude oil exports altogether.

Taxation of shale oil and gas

Federal and state governments may capture some of the resource rent through various taxes and use the revenues to support spending or funds that will raise future well-being. Taxing natural resource rents, if done properly, can be less distortionary than other forms of taxation (Box 2.1). A well-designed profit tax could reduce economic distortions which can discourage exploration and development. However, most governments rely on royalties and the rate applied can be relatively low. A few states have experienced a significant increase in revenues from resource related taxation (Table 2.2) and enjoyed a corresponding boost to spending (NASBO, 2013).

The taxation of oil and gas resources in the United States varies depending on the ownership of the land with the deposit. As the majority is on private land, the federal government has little influence on the taxation of these resources other than through the normal application of corporate income taxes, which is determined by Congress. When oil and gas deposits are on federal land, taxation on mineral resources is implemented by the Department of the Interior. The Department of the Interior (ONRR) collects revenues when bids for leases are made (bonus bids), rent while the lease is not in production (rental fees)

Box 2.1. Taxation of non-renewable natural resources

Profits derived from non-renewable resource extraction can be taxed while imposing relatively small distortions on the economy (Andrade de Sá and Daubanes, 2014). However, the form of taxation can influence the effort in exploration and development. While a number of options exist for taxing resources rents, in the United States, most governments rely on royalties (also known as severance taxes). Due to the split between federal and state tax authority, combinations state resource taxes and federal corporate income taxation are typical.

Royalty taxes are based on the amount of oil and gas extracted. While relatively easy to collect they introduce a number of distortions. The tax can induce the firm to shut extracting the oil and gas earlier than is socially optimal. Secondly, the tax can reduce incentives to invest in exploration, although this can be mitigated partially by offering investment subsidies. Broadway and Keen (2008) point out that this may give incentives for state governments to levy higher severance tax rates than they otherwise would if the royalties are deductible against federal corporate income tax. The range of rates levied across the states suggests that this is not an overriding concern. Profit taxation is another approach (implemented in Alaska in combination with a royalty tax), which is intended to capture a share of profits arising from the resource rent. In this approach a tax is levied on all real transactions on a cash flow basis. The government reimburses the private sector firm for negative cash flows, which are typical in the early stage of a project, and retain a share of total revenue when the project is generating a positive cash flow. In practice, governments find it hard to compensate a private sector firm contemporaneously and prefer to allow the private company to carry forward losses with interest. This form of taxation can potentially capture a large share of the resource rent without distorting investment and production decisions. Furthermore, the tax base is likely to differ from the resource rent and will again introduce distortions to investment and production decisions, though they are less severe than royalty tax regimes. A final approach is through using fixed fees for exploration and auctions for exploration rights to capture some of the resource rent. When other forms of taxation are also levied later on the project life, the amount of rent captured will be reduced or the fee will discourage investment.

Table 2.2. Tax revenue from oil and gas
Selected states with significant shale gas production

	Taxes on production as % of state GDP		Taxes on production as % of value added	All royalty taxes as % of state GDP	
	2007	2011	2011	2007	2011
Alabama	0.1	0.1	17.4	0.1	0.1
Alaska	7.1	10.4	58.1	5.5	11.2
Arkansas	0.0	0.1	7.0	0.0	0.1
California	0.1	0.1	11.8	0.0	0.0
Colorado	0.4	0.5	20.9	0.1	0.1
Kentucky	0.0	0.0	41.9	0.2	0.2
Louisiana	0.7	0.7	8.7	0.4	0.4
Michigan	0.0	0.0	27.1	0.0	0.0
Montana	0.2	0.2	26.4	0.8	0.8
New Mexico	1.6	1.4	27.9	1.3	1.0
North Dakota	0.3	0.4	16.5	1.4	6.9
Ohio	0.1	0.0	30.3	0.0	0.0
Oklahoma	1.3	1.2	17.0	0.7	0.5
Pennsylvania	0.0	0.1	15.3	0.0	0.0
Texas	1.2	1.1	16.1	0.2	0.3
West Virginia	0.3	0.2	25.3	0.6	0.9
Wyoming	3.2	3.2	23.7	2.4	2.5

Note: Royalty taxes are all royalty revenues, not just those accruing from oil and gas mining.

Source: BEA, Census bureau.

and royalties when production starts (royalties). Following criticism from GAO over the low federal government take (GAO, 2013), the Department of Interior changed offshore terms (royalty rates set at 18.75% for some offshore deposits, minimum bids, rental rates), but has not changed the onshore fiscal system (royalty rate of 12.5%). For deposit on federal land, the states also get a share of the revenues from the royalties. The split is 50-50 between the state and federal governments with the exception of resources lying on the outer continental shelf for which the revenue split for littoral state governments is 27% or 37.5% under the Gulf of Mexico Energy Security Act.

For oil and gas deposits on private or state owned land, there is no consistent tax treatment across the states. Taxes on production as a share of the oil and gas sector's value added ranges from just 7% in Arkansas to almost 60% in Alaska (Table 2.2). Royalty tax revenues accrue totally to the state if the land is privately held. Different royalty taxes are in place in 30 states, ranging from 10 cents on the barrel for oil in Ohio to 8% of gross value in Kansas. Alaska implements a hybrid system combining a royalty tax and a profits tax, which has more desirable properties. Pennsylvania, the third largest producer of shale gas in 2011, does not levy a specific tax. However, Pennsylvania introduced an unconventional gas well fee in 2012. If revenues exceed a threshold, surplus revenues will be distributed to localities. At the local level, states may share some of the royalty tax revenue with local governments. In addition, hydraulic fracturing rents are taxed through property and/or income taxes. In some cases, property taxes include mineral rights in the base.

Future generations

One challenge is to ensure that current resource use also supports economic welfare of future generations. On aggregate for the United States, estimates of adjusted net savings, which take into account whether total wealth (including natural resources) is

increasing, suggest that investment in education outweighs the depletion of natural resources (Box 2.2). Using revenues to support future living standards differs across the states. Some such as Alaska, Colorado, Montana, New Mexico and Wyoming have created severance endowment funds, which *inter alia* use revenues raised from oil and gas exploitation to help finance capital projects and invest in education. For example, West Virginia created a Future Fund, capturing 3% of the severance tax to fund infrastructure, education and economic development as well as tax relief and cultural preservation. The fund created limitations on how much lawmakers could draw on the fund (SWF Institute, 2014). The New Mexico Severance Tax Permanent Fund uses its resources to pay interest in bonds financing capital projects also investing in education. Other states have earmarked natural resource revenues to support spending that is less likely to benefit future generations. For example, West Virginia did not establish a specific mechanism to ensure future generations also benefitted from the mining of its substantial coal deposits. Rather revenues were spent annually. As coal mining in the state has weakened, the state is facing challenges in adapting to this environment (Williams, 2008).

In a number of cases, governments also collect revenues for conservation and remediation purposes. At the federal level, the Land and Water Conservation Fund (LWCF) was introduced in 1964 to capture some of the rent from the depletion of oil and gas resources on the outer continental shelf to protect other natural resources, such as coastal areas, open areas and wildlife habitat. At the state level, a few states levy taxes to address

Box 2.2. Natural resources and economic sustainability

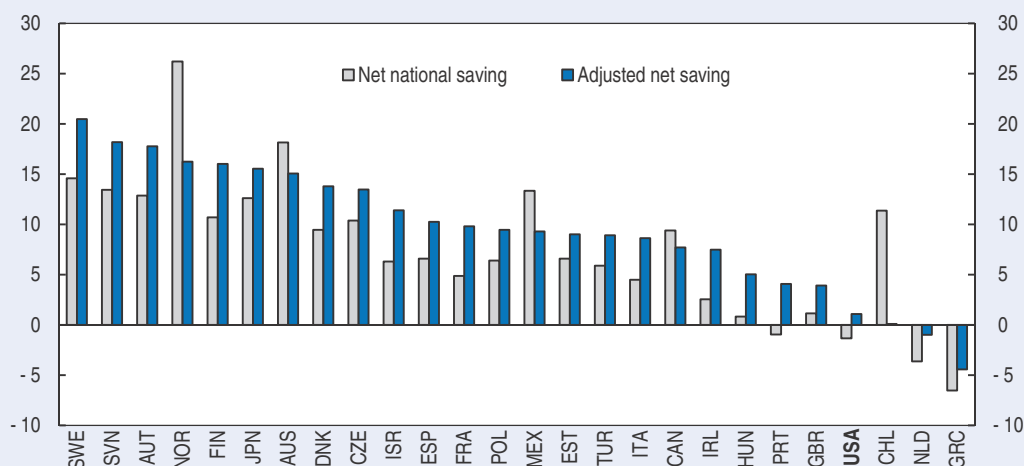
Non-renewable natural resources once (economically) recoverable will be *ceteris paribus* depleted. As such the country's stock of (natural) wealth is reduced, with the exploitation akin to a process of disinvestment. As such future generations are not guaranteed to share in the benefits of these natural resources. This has led some authors, such as Hartwick (1977), to recognise that investing the rents captured during the depletion of the exhaustible natural resource in (produced) capital can enhance sustainability. That is, not only the current generation enjoy the benefits from resource exploitation, but future generations also enjoy raised consumption possibilities. However, the degree to which natural and produced capital stocks are substitutable is not always clear cut and in some cases the amount of natural capital needs to be preserved above critical levels in order to provide environmental services that may provide life-support functions.

Identifying empirically whether the current patterns of natural resource exploitation is sustainable presents a number of difficulties in both the measurement of natural capital and identifying which types of investment will augment future generation's stock of wealth. Standard measures of economic development, such as GDP growth and measures of capital stocks generally do not consider the role of environment in production. A number of approaches have taken into account the environment.

One approach has been to adjust the standard measure of national savings by the depletion of natural resources and the impact on environment. The so-called genuine savings or adjusted net saving assess whether the exploitation of natural resources (and environmental externalities) does not subtract from economic welfare of future generations (World Bank, 2006). Updated estimates for 2008 suggest that for the United States that net savings (gross national savings minus consumption of fixed capital) was negative. However, adjusted net saving was positive when taking into account education spending and making adjustments for the depletion of energy and mineral resources and environmental damage from carbon dioxide emissions and particulate matter. Nonetheless, savings in the United States were comparatively small by both measures (Figure 2.6).

Box 2.2. **Natural resources and economic sustainability** (cont.)Figure 2.6. **Adjusted national savings (2008)**

As a percentage of GNI



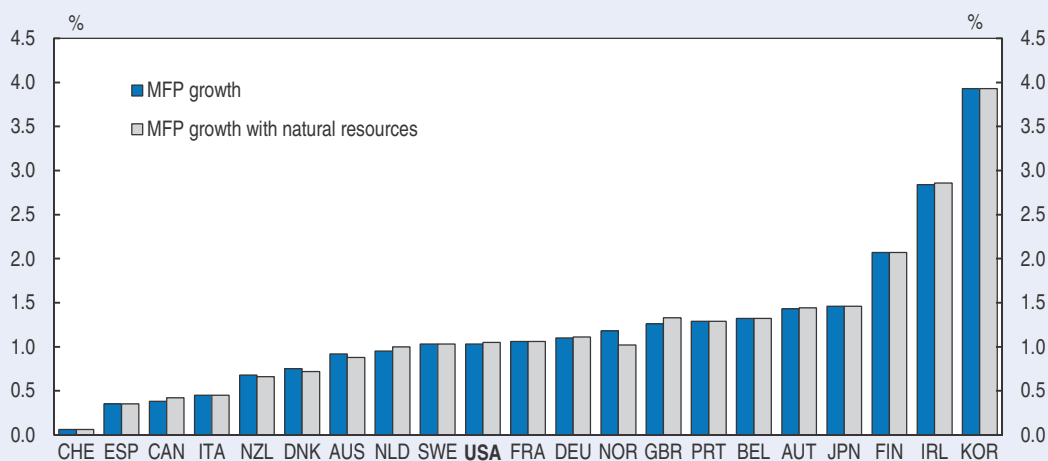
Source: World Bank.

StatLink <http://dx.doi.org/10.1787/888933081587>

Related and recent work at the OECD has attempted to take account of the use of certain types of natural capital through adjustments to productivity measures (Brandt et al., 2013). This work (covering the period 1986 to 2008) suggests for the United States that the difference between traditional and adjusted productivity measures is not large (Figure 2.7). However, during this period, oil and gas reserves fell and the contribution of natural capital to growth was slightly negative overall. As such, during the period of resource depletion, other factors of production needed to increase slightly to maintain similar rates of growth.

Figure 2.7. **Average annual productivity growth with and without natural capital**

Based on data from the OECD Productivity Database, 1986-2008



Note: The MFP growth with natural resources is derived by extending a standard production function with measures of natural resource flows and estimates of their associated unit costs.

Source: Brandt et al. (2013).

StatLink <http://dx.doi.org/10.1787/888933081606>

oil field clean ups and restoration, including Louisiana and Texas. Several other states levy oil and gas conservation fees which are earmarked for capping and reclaiming abandoned wells amongst other uses.

Local impacts

Hydraulic fracturing has aroused considerable controversy. The environmental and social impact of large scale drilling activity across the landscape has provoked significant local opposition in some parts of the country. Bans have been imposed in New York State, metropolitan Pittsburgh and a handful of towns around the country. However, survey findings reveal respondents are not necessarily opposed to hydraulic fracturing, but want assurances that it will be conducted correctly (Krupnick, 2013), implying a role for regulatory frameworks in facilitating stakeholder acceptance (IEA, 2012).

Local externalities

At the local level, inhabitants experience a number of externalities (Muehlenbachs et al., 2012). Close to the well inhabitants face (adjacency) costs associated with noise and light pollution, local air pollution, visual dis-amenities (pollution). In addition, there are a number of vicinity effects as people are affected by the impact of traffic congestion and road damage as the road pavement in rural areas are often not constructed for the heavy vehicles. The major impacts for residents are arguably through the environmental externalities created by hydraulic fracturing. There is considerable uncertainty about these effects and the science far from settled. The impact on the local environment is not universally negative. The substitution of coal and other fuels by natural gas may have effects through reducing other emissions, such as sulphur dioxide, carbon monoxide, nitrous oxides and particulate matter.

Hydraulic fracturing puts stress on water resources...

Up to 5 million gallons of water are needed for each shale gas hydraulic fracturing well. This demand in a relatively short period of time puts stress on local water resources, which is not limited to a problem of arid regions. Demands on water resources have mounted and water stress has become a more common phenomenon. The rate of extraction of ground water from aquifers has increased over the 20th century, partly driven by land drainage to extend farmland. Since the turn of the 21st century, the rate of ground water depletion has accelerated, such that slightly less than one-fifth of total groundwater depletion since 1900 occurred in the period 2000-08 (USGS, 2013). While hydraulic fracturing only accounts for a small fraction of the demand for water, the localised demand for a short period can create important stresses on water resources. For surface water, such demands can threaten the environmental services provided by the local ecosystems when water levels or flows drop precipitously.

Respecting the competing demands on water resources requires adequate water rights are in place, while respecting minimum flow requirements for water bodies. Pricing water resources effectively and allowing trading may go some way to using limited water resources efficiently. Remediation efforts and biodiversity-offsets or compensatory mitigation, which ensure that the environmental damage in one area is compensated in another, can play a role to mitigate excessive stresses on water resources. For example, the EPA has established “mitigation banking” to preserve wetlands. Under this approach, projects that will have unavoidable impacts on wetlands must purchase offset credits to

support the establishment, restoration or enhancement of wetlands in a different location, which may be undertaken by a third party. In a similar approach to offsets, the federal government uses royalties from the depletion of oil and gas resources on the outer continental shelf held in the Land and Water Conservation Fund (LWCF) to protect other natural resources. Similarly, the Energy Policy Act of 2005 established the Coastal Impact Assistance Program (CIAP) which provides money for coastal restoration and preservation for littoral states. While the offset approach has attractive properties, care is needed to ensure that there are not non-linearities with the depreciation of natural capital in one location that cannot be offset by supporting natural capital in another (see Dasgupta, 2009 for a general consideration of these issues). In this context, the permitting authority needs to ensure that the proposed project does not have unavoidable (irreversible) consequences, such as contamination of a groundwater aquifer, that outweigh the proposed benefits. When irreversible effects are a concern, the regulatory authority should postpone decisions until new information helps reduce uncertainty about the consequences. Such decisions should also account for the public's preferences for environmental services, which vary across the country. In this context, taking stock of opinions, such as is done by Canada's biennial Household and the Environment Survey, would help better inform decisions concerning the environment at both the national and state level.

... and risks water contamination

Risks from hydraulic fracturing wells include contamination of shallow freshwater aquifer and surface water with chemicals and other substances used or released in the fracturing process. Reports examining the potential for contamination of drinking water suggest that risks to aquifers are low if the hydraulic fracturing takes place at sufficient depth. However, contamination risks stemming from faulty wells and accidental spillage leading to surface water contamination remain (Royal Society, 2012). Groundwater contamination risk remains a major concern expressed by residents. This can also be seen through the effect on property prices. Early evidence, using data from Pennsylvania and New York on house sales and well placement suggests that houses near the wells benefit from economic rents, but within a close radius of 1-1.5 km, the fear of groundwater contamination pushes house prices down (between 10% and 22%) compared to houses that rely on public water supplies (Muehlenbachs et al., 2012). Households may suffer from adjacency effects, which push prices down further next to the wells. Overall the study noted that the benefits from shale gas arrive quickly but then dissipate, consistent with a boom and bust type of development.

Water is often co-produced with hydraulic fracturing, which creates challenges for treatment and disposal, such as separating out and re-injecting in lower appropriate disposal zones. Some of the water introduced in the well (15-80%) will become "flowback", which may need to be treated due to chemicals added to the fracturing fluids as well as the materials mobilised during the fracturing process, such as heavy metals and naturally-occurring radioactive materials. The wastewater may be recycled and used in other wells, re-injected deep underground (often into saline aquifers), treated and added to surface water or spread over the land. Kiviat (2013) reports a number of incidents where hydro-fracturing fluids have been released into the environment and discusses the implications for biodiversity. Empirical work suggests that the major problems are more likely to be found at the treatment sites than the wells (Olmstead et al., 2013). Fracturing fluids contain chemicals to separate the oil and gas from the rock formations and ease

their passage through the rock as well as propping agents which hold the rock formations open to allow the natural gas and oil to flow through the horizontal portion of the well to the vertical portion of the well. Some states have not required the disclosure of what chemicals are being used in fracturing fluids (McFeeley, 2012). However, other states have begun to require industry participants to report which chemicals are being used and voluntary reporting of chemicals is occurring with groups such as Fracfocus and the EPA is seeking public comments on disclosure. While exemptions to public disclosure due to trade secrets can be part of the disclosure regime, these should not become a loophole and companies should be required to report the chemicals being used to a regulatory authority.

The regulatory regime is complex

Regulation on water use and the protection of groundwater and surface waters has originated at different levels of governments, which has resulted in a complex overall regulatory regime. For example, local authorities, groundwater management areas and regional planning bodies are involved in granting access to water resources, and state and federal bodies are responsible for environmental management and stewardship. Most regulation of hydraulic fracturing is issued at the state level, although the Department of Interior can regulate hydraulic fracturing on federal land and EPA has some limited responsibility, which is typically implemented by authorised states, tribes and territories. Under the federal Safe Drinking Water Act, EPA's regulations specify minimum permitting requirements applicable to hydraulic fracturing of oil and gas wells using diesel fuels. The EPA released guidance to state and EPA regional permit writers in 2014. These regulations also apply to underground injection of wastewaters from oil and gas production (irrespective of use of diesel fuels) for purposes of disposal. In addition, under the federal Clean Water Act, EPA's regulations restrict the discharge of hydraulic fracturing wastewater to surface waters under the national technology-based limitations programme. However, federal regulatory authority to address water quality impacts of hydraulic fracturing is limited under several key environmental statutes – for example, the oil and gas stormwater exemption from permitting requirements under the Clean Water Act and the exclusion of hydraulic fracturing (other than where diesel is used) from the Safe Drinking Water Act Underground Injection Control requirements. The federal authorities can also become involved when the EPA issues an endangerment order, which can require a company to take immediate action to protect individuals from harm (Rahm, 2011). Further study is needed to formulate regulation to address environmental concerns and increase public confidence in hydraulic fracturing, notably to harmonise and strengthen the impact assessments of drilling projects.

What happens when things go wrong?

Transportation needs for shale oil and gas have grown rapidly, often in regions where the existing pipeline capacity is insufficient. This has led to a surge in railroad transport, with the number of railroad carloads of crude oil jumping an estimated 42 times between 2008 and 2013 (Association of American Railroads, 2013). Rail in late 2013 accounted for the transport of around 800 000 barrels a day or 11% of total oil shipments. The transport of crude oil by train raises a number of risks. During 2013, a number of accidents, including the explosion in North Dakota, reignited concerns about the safety of this mode of transport, particularly in the aftermath of the Lac Mégantic tragedy in Canada. In this context, measures to help develop pipeline capacity, such as expediting the

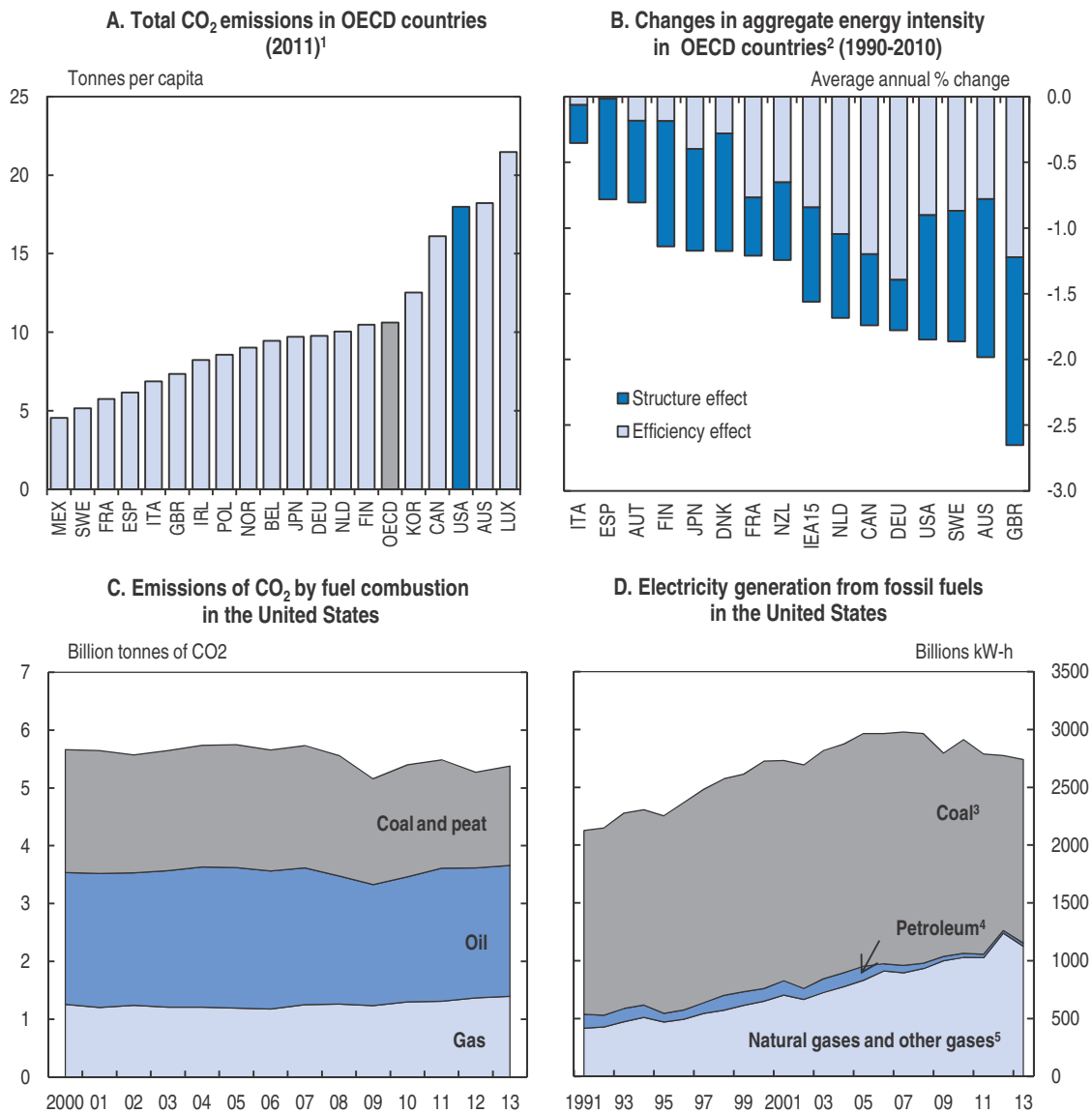
planning process and reducing uncertainty about projects, would be welcome. However, due to the dispersed nature of drilling, transporting oil to the pipelines will still require other means of transportation. Federal authorities are responsible for setting rail standards while state authorities, such as New York, are drawing up contingencies plans for the possibility of accidents. To some extent, railroad transport is also favoured by the Jones Act, which bans foreign shipping undertaking cabotage in US coastal waters. Railroads are ideally placed to benefit from the lack of domestic shipping capacity.

A second area is what happens in the aftermath of significant environmental damage. After the Deepwater Horizon event, Congress passed the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies (RESTORE) which channelled penalties levied under the Clean Water Act for coastal restoration. Applying similar approaches for hydraulic fracturing may run into problems. Due to the smaller size of firms involved, the possibility of appealing for bankruptcy can mean that penalties will not cover all damage costs if the firm is found liable and it will not internalising the externalities. Requiring insurance-type payments may lead to riskier behaviour than otherwise. In this context, levying restoration fees, as many states already do to deal with clean-up costs and abandoned wells, while leaving firms liable may be a reasonable approach. Alternatively, regulators could set verifiable precautionary standards backed up by legal proceedings (Hiriart et al., 2004). An alternative approach could be implemented through bonding requirements, which are already used in a number of states and by the federal government. Under this approach, companies post bonds prior to drilling wells. If the exploitation results in no environmental damage the bond is returned to the company when production at the well ceases (Davis, 2014). States with a longer experience of oil and gas production tend to have stricter regulations in place and levy restoration fees or bonds (Richardson et al., 2013).

Links to climate change

In 2009, the United States committed to the goal of reducing greenhouse gas (GHG) emissions in the range of 17% from 2005 levels by 2020. There have been sizeable reductions in emissions, partly arising due to the recession as well as to improvements in energy efficiency in the economy (Figure 2.8). In 2012, carbon emissions from the energy sector fell to the lowest level in two decades. Among OECD countries, the United States has achieved among the biggest improvements in energy intensity in recent decades, albeit from relatively high levels. Its energy intensity declined at an average rate of 2% per year from 1980 to 2010. In recent years, policy efforts to improve energy efficiency further have been reinforced. For example, the 2009 economic stimulus package included new energy efficiency initiatives and substantial additional funding for existing programmes. In June 2013, the administration unveiled a comprehensive Climate Action Plan, including a plan to impose carbon emissions standards to both new and existing power plants.

Despite the positive trends, preliminary data show that carbon dioxide emissions are estimated to have risen by around 2% in 2013. During the summer of 2013, higher demand for electricity induced an increase in coal-fired electricity supply and severe winter weather raised energy demand at the end of the year, boosting carbon dioxide emissions and highlighting the interplay between weather conditions and the electricity sector (Box 2.3).

Figure 2.8. **Some progress in reducing greenhouse gas emissions**

1. 2010 for Mexico.


2. For the United States, data are mainly compiled and estimated by the IEA based on available sources including IEA energy balances, US Energy Information Administration, US Bureau of Transportation Statistics, Oak Ridge National Laboratory, OECD STAN Database, US Census Bureau and Pacific Northwest National Laboratory.

3. Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal synfuel.

4. Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

5. Natural gas, plus a small amount of supplemental gaseous fuels. Other gases: Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

Source: International Energy Agency and US Energy Information Administration.

StatLink  <http://dx.doi.org/10.1787/888933081302>

The current approach to meet climate change objectives relies less on using market-based instruments, such as an emission tax, and more on regulation. In this context, the EPA is charged with regulating greenhouse gas emissions from electricity generation under the Clean Air Act. The states will have flexibility in how to implement these requirements for power plants in their jurisdictions, thereby allowing them to choose locally-appropriate compliance measures. Other initiatives to improve energy efficiency will serve to reduce

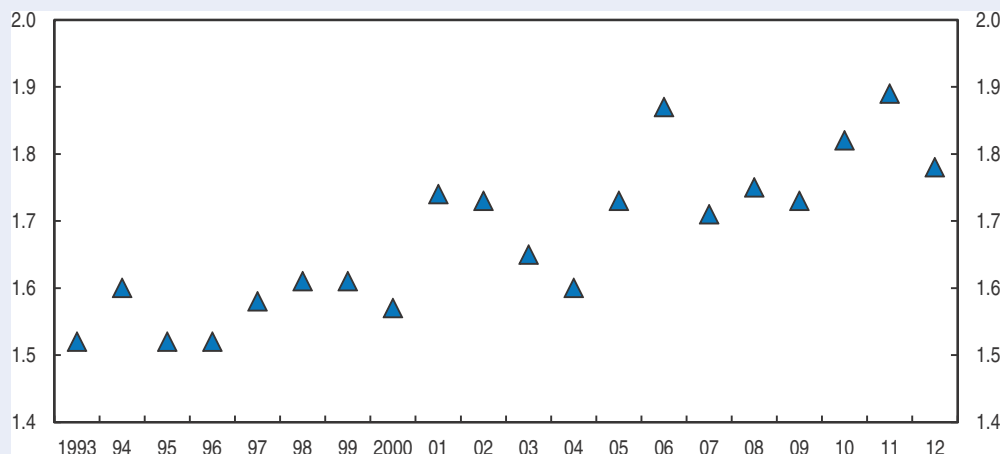
Box 2.3. Greater weather variability

The scientific evidence assessed by the Intergovernmental Panel on Climate Change (IPCC, 2013) points to climate change amplifying extreme weather events, with the effects varying regionally. The types of extreme weather events that are becoming more frequent include longer heat waves and heavier precipitation. In North America the threat of flooding and more intense storms also appears to have risen.

The combination of changing weather patterns with trends in energy demand has had implications for electricity generation. Energy demand has changed as the share of industry in total output has fallen, technology has become more energy efficient and the greater diffusion of air conditioning. These trends have led to electricity demand becoming more weather sensitive such that when weather conditions lead to more use of cooling or heating, demand for electricity surges. Over time as the reduction in consumption from sectoral change and improved energy efficiency has reduced the average demand for electricity, the increasing sensitivity of demand to heating or cooling has seen the ratio of peak to average demand for electricity gradually increase (Figure 2.9). During the periods of surges in demand, the marginal producer of electricity may change with corresponding changes in fuel type. In 2013, more days had pronounced peaks in temperature which would require cooling in buildings (raising cooling degree days) while the winter in early 2014 was exceptionally cold raising the amount of heating needed to maintain a comfortable temperature in buildings (raising heating degree days). Partly as a result, emissions of carbon dioxide from coal rose by an estimated 2%, reversing some of the gains in emission reductions recorded over the previous five years as previously mothballed coal-fired power stations were brought back on line. Greater weather variability complicates the management of the electricity market and potentially makes climate change mitigation more difficult to achieve in the absence of other measures. To the extent that the weather patterns are becoming more volatile, these challenges may become more difficult to address.

Figure 2.9. **Variation in electricity demand is growing**

Ratio of peak-to-average electricity demand in New England



Source: Energy Information Administration.

StatLink  <http://dx.doi.org/10.1787/888933081625>

emissions further. This approach to emission abatement is arguably more costly than an emission tax, though by inducing fuel switching may achieve some reductions at relatively low cost (Goulder et al., 2014). However, with this approach, care is needed to prevent the marginal abatement costs diverging too much. Given the variety of approaches the states are likely to adopt, including market-based cap-and-trade schemes (see Box 2.4), regulation may be needed to limit differences in the stringency of regulation as well as address possible co-ordination failures across states. Carefully designed state-level policy has the potential to achieve considerable emission mitigation at relatively low cost (Burtraw et al., 2014).

Box 2.4. The Regional Greenhouse Gas Initiative

In 2009, the Regional Greenhouse Gas Initiative (RGGI), bringing together initially 10 states, introduced a cap-and-trade programme for carbon dioxide emissions.* The initiative covers all large fossil-fuel electricity plants in the states with the cap based on long-term modelling predating the dramatic changes in energy prices, resulting in an initial allocation of too many allowances. The substitution towards natural gas has been particularly pronounced in the states covered by RGGI, with coal and oil-fired electricity generation falling from accounting for 35% of electricity production in 2005 to 13% in 2012. Furthermore, clement weather conditions reducing energy demand also helped bring down emissions dramatically below the agreed cap. In response, 9 of the original 10 states agreed to a 45% reduction in the cap from 2014. In addition, the cap is now designed to tighten further gradually. This feature should mean the emission cap becomes more challenging over time and that the price of emission allowances begins to rise. The states use revenues from the auction of allowances to support renewable energy and energy efficiency programmes.

To some extent the approach to climate change adopted by the administration, which has the effect of making coal-fired electricity generation less competitive, benefits schemes like RGGI by levelling the playing field and reducing possible concerns about “leakage”. Nonetheless, combining command and control approaches with market mechanisms risks increasing the overall costs of climate change mitigation.

* California subsequently introduced a cap-and-trade programme in 2012.

Shale gas can help reduce emissions

Natural gas is a potential “bridge fuel” towards a lower carbon economy. The rapid development of US shale gas resources has helped to reduce emissions by leading to a substitution away from coal-powered electricity generation to natural gas turbines (Figure 2.7). Indeed, coal-fired power stations have been under pressure from slowing electricity demand and competition from low natural gas prices. Coal-fired electricity generation has fallen by around 11 percentage points of total electricity production between 2008 and 2012, while natural gas accounted for a rise of 9 percentage points between 2008 and 2012, suggesting little “rebound effect” induced by cheaper natural gas prices. Furthermore, prospects for some coal-fired power stations are weakened further by Mercury and Air Toxics Standards (MATS) which will take effect in April 2015. The EIA (2012) projects that this will lead to significant retirement of coal-fired power capacity. These trends are likely to reduce externalities significantly. Detailed county-level modelling for the United States suggests that by taking into account estimates of the

environmental and health impact of coal-fired power generation the harmful impact of air pollution from the sector is double the conventional measure of value added. By contrast, the ratio of harmful impacts of air pollution from natural gas-fired generation to the sector's value added is only one third (Muller et al., 2011).

Natural gas can play a role in helping renewable energy gain a greater share of electricity generation by helping to address the intermittency problem. Renewables are often a “must-take” generation source, which means that when electricity generation from renewable sources fluctuates the system operator must somehow achieve balance elsewhere (Weiss et al., 2013). From a security-of-supply perspective renewables can thus create challenges to system operators. As natural gas fired generators can adapt relatively quickly to changes in demand and supply they have a role to play in facilitating the expansion of renewables. This might happen because electricity production from natural gas would help meet demand when generation from wind and solar electricity drops or rises due to changes in wind and sunlight. In this context, an energy mix focusing on the combination of natural gas and renewables in electricity generation will go a long way towards providing reliable supply while lowering US greenhouse gas emissions. However, gas-powered generators cannot react quickly enough to offset sudden large surges or drop offs in renewable supply. In this context, developing storage capacity, smart grid technologies and price sensitive demand would complement renewable and natural gas generated electricity (Benatia et al., 2013).

Finally, relatively low natural gas prices will also affect emissions from the transport sector, making natural gas powered vehicles more attractive. Already low natural gas prices and the expectation that they will remain low has induced investment in natural gas powered vehicles. The implementation in 2014 of EPA regulations extending fuel economy standards to medium and heavy-duty vehicles will likely give a further fillip to natural gas powered vehicles. As the refuelling network is expanded this could induce an expansion from short-haul to long-haul trucking, leading to further gains in emission reductions (EIA, 2013). The EIA projects that the transportation sector's consumption of natural gas will almost double by 2040, with a large part of demand driven by gas-powered heavy duty vehicles.

The shale gas challenge for climate change

Fugitive methane emissions and gas flaring

While the substitution of natural gas for coal leads to lower emissions in electricity generation, the production of non-conventional natural gas leads to emissions of fugitive methane during production, due to leaks from loose fitting pipes and venting from gas wells, and transportation. More work remains to be done to quantify the scale of these emissions and at what points in production and transportation they occur. More is known about production than distribution (Allen et al., 2013; EPA, 2013; IEA, 2012). Accounting for these emissions could significantly reduce the climate benefits from switching to natural gas, though they are unlikely to offset the long-term benefits from substituting away from coal. Furthermore, relatively few sources may be high emitters and tools to identify rapidly and fix these leaks could have large benefits (Brandt et al., 2014).

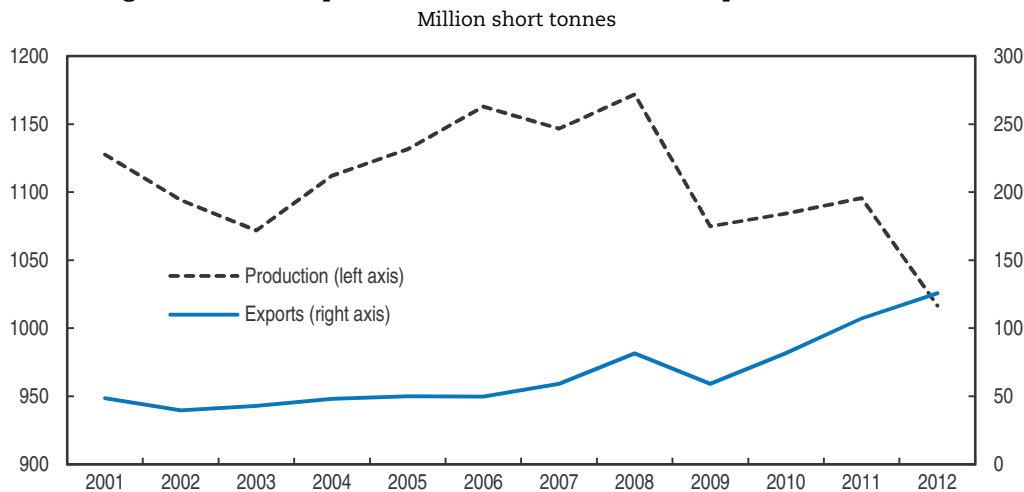
The EPA has in place a long-standing and voluntary Natural GasSTAR Programme that encourages the use of cost-efficient technologies to reduce and capture methane emissions. The administration has announced a strategy to reduce methane emissions from the oil and gas sector, building on the STAR programme. EPA guidance was to flare

these emissions, as this reduces the potency of the emissions, but following amendments to air regulations for the oil and gas industry in 2012 (new source performance standards) companies are encouraged to move towards “green completion” of wells, which separates gas and liquids flowing from the well and captures the gas. The second phase of the amendments starting in 2015 requires companies to capture the gas and make it available for use or sale. In some cases, states and local governments have already moved to address this issue. For example, Colorado, in collaboration with industry, has established regulations on minimising methane emissions. In other cases, states have considered using taxation on flaring or venting, which would help gas producers internalise global externalities. The differences across states regarding regulations on flaring or venting methane can be considerable, partly reflecting the relative development of pipeline infrastructure. For example, flaring methane in Texas is permitted in some cases for 180 days, whereas in North Dakota flaring is allowed for one year before becoming liable to pay taxes and royalties on the flared gas. In addition, exemptions may then be granted if there are difficulties in connecting to a pipeline. At times, almost one-third of all gas produced in North Dakota has been flared or otherwise not marketed (EIA, 2011).

Knock on effects on energy markets

The substitution of natural gas for coal has seen repercussions on the market for coal. Despite declining domestic demand, US coal production has fallen relatively little as coal exports have more than doubled since the shale gas boom began to take hold in 2007 (Figure 2.10). Low carbon permit prices on the European market are inducing energy producers to increase their combustion of coal leading to a global rise in carbon emissions. Appropriately pricing the carbon content of fuels, such as with an emission tax, both in the United States and other countries, would ensure that the environmental benefits of switching to natural gas in one country are not lost through increasing coal consumption in other countries (see Golosov et al., 2014). Further rapid increases in coal exports may be limited by capacity constraints at existing export terminals coupled with local opposition – concerned about particulate matter pollution – to increasing railroad transportation and constructing new coal yards at ports.

Figure 2.10. Coal production has fallen while exports have risen



Source: Energy Information Administration.

StatLink  <http://dx.doi.org/10.1787/888933081644>

Risks of lock-in

A final challenge for climate change policy arises from the risk of lock in, whereby choices made today will limit the opportunities available in the future. The development of shale gas can support the transition towards a lower carbon economy. As seen above, relatively low natural gas prices have already encouraged fuel substitution towards less carbon-intensive energy production and provide a platform on which to build. The question is will natural gas act as a “bridge fuel” to moving towards a zero net emissions target or lead to inertia to additional mitigation, which may also arise due to stranded assets. In the absence of concerted action to manage the transition there is a danger that as relative prices change or in the longer-term as natural gas begins to be depleted the energy market will respond by switching back to coal-fired power. In this context, while the shale gas boom could provide the “bridge fuel” towards a lower carbon economy, flanking measures (emission pricing, subsidising innovation, supporting renewables and developing smart electricity grids) will be required to ensure this outcome. In particular, two areas where flanking measures may be required are in countering natural gas hindering renewables and low prices stymieing innovation.

The expansion of natural gas fired generation may hinder the future development of renewable energy. The development of smart grids – which offers the potential to harness renewable energy effectively – is incremental and path dependent (Koenigs et al., 2013). Without careful preparation, the current expansion of natural gas and development of the supporting electricity infrastructure could hinder future movement towards a lower carbon economy by creating difficulties in integrating a larger share of more volatile renewable sources of energy. Against this background, the different government and private actors need to co-ordinate their activities and support long-term investments that will re-orientate transmission and distribution towards networks which can accommodate a larger share of low or (net) no carbon electricity generation. The US Energy Independence and Security Act (2007) and the American Recovery and Reinvestment Act (2009) have provided government support and funding for nationwide modernisation of the electrical grid and ensure stable mid-term prospects for private investors. The Federal Energy Regulatory Commission also works to promote the modernisation of the grid and the integration of renewables in electricity generation. Such actions are important in overcoming possible lock in effects.

At the state level, Renewable Portfolio Standards, in place in 30 states, will ensure that renewable sources account for a set share of generation. Under these programmes, electricity providers are mandated to purchase a specified share of electricity from renewable generation sources, usually with the share rising over time. While these policies have had a strong effect on the growth of this sector, and they may counter the danger of lock in, they nonetheless come at a higher cost than market-based mechanisms. However, removing restrictions in state Renewable Portfolio Standards on the location of renewable generation and mitigating federal and state incentives to generate power when prices are negative would increase the social benefit of these programmes. (Schmalensee, 2013). Well-targeted and time-limited policies to support renewable energy can speed the deployment of renewable energy generation capacity.

A final area where low natural gas prices may present a challenge to greenhouse gas mitigation is through the effect on innovation. The United States is a leader in innovation on energy efficiency technologies, although only a fraction of government R&D support is allocated to the environment and energy (about 1.8% of government R&D). Patent filings related to green growth have been steadily rising since 1990 and began outpacing the growth of total US patents since 2005. The impressive gains in energy efficiency witnessed over the past decades were partly driven by high prices driving innovation in energy-saving technology (Popp, 2002; Aghion et al., 2012). In order to mitigate these undesirable outcomes, some subsidisation of innovation in energy saving technology to “direct” technical change would be warranted. Such an approach would be in line with the policy mix advocated by Acemoglu et al. (2012), who showed that optimal environmental policy would use carbon taxes in combination with subsidies to direct innovation activity towards the “clean” sector when goods are substitutable. Case study evidence supports an approach of combining taxation and subsidisation in promoting innovation to improve environmental outcomes (OECD, 2010). At the federal level, the America COMPETES Act created the Advanced Research Projects Agency – Energy, which funds energy technology projects. More recently, the administration has proposed to create an Energy Security Trust Fund, which would work in this direction. Certain states, notably California – and also participants in RGGI – have also invested in promoting energy efficiency and clean generation technologies.

Recommendations

Hydraulic fracturing

- Study the environmental impacts of hydraulic fracturing and develop regulations to address any negative impacts including, if necessary, legislative action to harmonise regulation across states and strengthen *ex ante* environmental impact assessments for drilling projects.
- Invest in skills and infrastructure using receipts from profit taxes levied on oil and gas production.

Climate change

- Further lower emissions with efficient policy tools as part of the climate-change strategy, notably by putting a price on greenhouse gas emissions, though well-designed regulation and investment in renewables also have a role to play.
- Promote innovation in energy saving and low carbon technology.

Further recommendations

- Ensure that trade restrictions do not hamper energy exports.
- Study the problem of fugitive methane emissions, and develop regulations to address any negative impacts.
- Promote investment in infrastructure for energy transportation, taking into account safety concerns.

Bibliography

- Acemoglu, D. et al. (2012), "The Environment and Directed Technical Change", *American Economic Review*, Vol. 102, No. 1, pp. 131-166.
- Aghion, P. et al. (2012), "Carbon Taxes, Path Dependency and Directed Technical Change: Evidence from the Auto Industry", *NBER Working Paper*, No. 18596.
- Allen, D. et al. (2013), "Measurement of Methane Emissions at Natural Gas Production Sites in the United States", *Proceedings of the National Academy of Sciences*.
- Andrade de Sá, S. and J. Daubanes (2014), "Taking the Rent of Non-renewable Resource Sectors: A Theoretical", *OECD Economics Department Working Papers*, OECD Publishing, Paris, forthcoming.
- Arrow, K. et al. (2012), "Sustainability and the Measurement of Wealth", *Environment and Development Economics*, Vol. 17, pp. 317-353.
- Arrow, K. et al. (2013), "Determining Benefits and Costs for Future Generations", *Science*, Vol. 341, pp. 349-350.
- Association of American Railroads (2013), *Moving Crude Oil by Rail*, December 2013.
- Benatia, D., N. Johnstone and I. Haščič (2013), "Effectiveness of Policies and Strategies to Increase the Capacity Utilisation of Intermittent Renewable Power Plants", *OECD Environment Working Papers*, No. 57, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5k46j0trlrnn-en>.
- Brandt, N., P. Schreyer and V. Zipperer (2013), "Productivity Measurement with Natural Capital", *OECD Economics Department Working Papers*, No. 1092, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5k3xnhsz0utg-en>.
- Brandt, A. et al. (2014), "Methane Leaks from North American Natural Gas", *Science*, Vol. 343, pp. 733-735.
- Burtraw, D., J. Linn, K. Palmer and A. Paul (2014), "Consequences of Clean Air Act Regulation of CO₂ from Power Plants", *Resources for the Future, Discussion Paper*, No. 14-01.
- CEA (2013), *Economic Report of the President*, United States Government Printing Office, Washington, DC.
- Celasun, O. et al. (2014), "The US Manufacturing Recovery: Uptick or Renaissance?", *IMF Working Paper*, No. WP/14/28.
- Dasgupta, P. (2009), "The Welfare Economic Theory of Green National Accounts", *Environmental Resource Economics*, Vol. 42, pp. 3-38.
- Davis, L. (2013), "Bonding Requirements for Natural Gas Producers", *Energy Institute at Haas Working Paper*, No. 232r.
- Egerer, J., J. Rosellon and A.P. Schill (2013), "Power System Transformation towards Renewables: An Evaluation of Regulatory Approaches for Network Expansion", *DIW Berlin Discussion Papers*, No. 1312.
- EIA (2011), "Over One-third of Natural Gas Produced in North Dakota is Flared or Otherwise Not Marketed", *Today in Energy*, 23 November 2011, www.eia.gov/todayinenergy/detail.cfm?id=4030.
- EIA (2012), "27 Gigawatts of Coal-Fired Capacity to Retire over Next Five Years", *Today in Energy*, 27 July 2012, www.eia.gov/todayinenergy/detail.cfm?id=7290.
- EIA (2013), *Annual Energy Outlook 2013*, US Energy Information Administration.
- EPA (2013), *Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2011*, Environmental Protection Agency, Washington, DC.
- GAO (2013), "Oil and Gas Resources: Actions Needed for Interior to Better Ensure a Fair Return", *Report to the Chairman, Committee on Energy and Natural Resources, US Senate*, GAO-14-50.
- Goldman Sachs (2013), "The US Manufacturing Renaissance: Fact or Fiction?", *US Economic Analyst*, No. 13/12, 22 March 2013.
- Golosov, M. et al. (2014), "Optimal Taxes on Fossil Fuels in General Equilibrium", *Econometrica*, Vol. 82, No. 1, pp. 41-88.
- Goulder, L., M. Hafstead and R. Williams (2014), "General Equilibrium Impacts of a Federal Clean Energy Standard", *NBER Working Paper*, No. 19847.
- Hamilton, K. and G. Atkinson (2013), "Resource Discoveries, Learning and National Income Accounting", *World Bank Policy Research Working Paper*, No. 6505.

- Hartwick, J. (1990), "Natural Resources, National Accounting and Economic Depreciation", *Journal of Public Economics*, Vol. 43, pp. 291-304.
- Hiriart, Y., D. Martimort and J. Pouyet (2004), "On the Optimal Use of Ex Ante Regulation and Ex Post Liability", *Economic Letters*, Vol. 84, pp. 231-235.
- IEA (2012), *Golden Rules for a Golden Age of Gas: World Energy Outlook Special Report on Unconventional Gas*, International Energy Agency, Paris, www.worldenergyoutlook.org.
- IPCC (2013), *Climate Change 2013: The Physical Science Basis*, Intergovernmental Panel on Climate Change, Bonn.
- Jacoby, H., F. O'Sullivan and S. Paltsev (2011), "The Influence of Shale Gas on US Energy and Environmental Policy", MIT Joint Program on the Science and Policy of Global Change, *Joint Program Report Series*, No. 207.
- Kiviat, E. (2013), "Risks to Biodiversity from Hydraulic Fracturing for Natural Gas in the Marcellus and Utica Shales", *Annals of the New York Academy of Sciences*, Vol. 1286, pp. 1-14.
- Krautkraemer, J. (1998), "Nonrenewable Resource Scarcity", *Journal of Economic Literature*, Vol. 36, No. 4, pp. 2065-2107.
- Koenigs, C. et al. (2013), "A Smarter Grid for Renewable Energy: Different States of Action", *Challenges*, Vol. 4, pp. 217-233.
- Krupnick, A. (2013), *Managing the Risks of Shale Gas: Key Findings and Further Research*, Resources for the Future.
- Landefeld, J. and S. Villones (2009), "GDP and Beyond: Measuring Economic Progress and Sustainability", *BEA Working Paper*.
- Lee-Ashley, M., J. Goad, M. Madowitz and M. Conathan (2013), "Protecting the Taxpayer's Share of Natural Resource Revenues on Public Lands and Oceans: The Costs, Benefits, and Risks on Natural Resource Revenue Proposals Before Congress", Center for American Progress.
- McFeeley, M. (2012), "State Hydraulic Fracturing Disclosure Rules and Enforcement", *NDRC Issues Brief*, July 2012.
- McKinsey Global Institute (2013), *Game Changers: Five Opportunities for US Growth and Renewal*, McKinsey Global Institute.
- Muehlenbachs, L., E. Spiller and C. Timmins (2012), "Shale Gas Development and Property Values: Differences across Drinking Water Sources", *NBER Working Paper*, No. 18390.
- Muller, N., R. Mendelsohn and W. Nordhaus (2011), "Environmental Accounting for Pollution in the United States Economy", *American Economic Review*, Vol. 101, No. 5, pp. 1649-1675.
- NASBO (2013), *The Fiscal Survey of States: Fall 2013*, National Association of State Budget Officers, Washington, DC.
- OECD (2010), *Taxation, Innovation and the Environment*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264087637-en>.
- Olmstead, S. et al. (2012), "Shale Gas Development Impacts on Surface Water Quality in Pennsylvania", *Proceedings of the National Academy of Sciences*, published online 11 March 2013.
- Popp, D. (2002), "Induced Innovation and Energy Prices", *American Economic Review*, Vol. 92, No. 1, pp. 160-180.
- Rahm, D. (2011), "Regulating Hydraulic Fracturing in Shale Gas Plays: The Case of Texas", *Energy Policy*, Vol. 39, pp. 2974-2981.
- Richardson, N. et al. (2013), *The State of State Shale Gas Regulation*, Resources for the Future, Washington, DC.
- Schmalensee, R. (2013), "The performance of US Wind and Solar Generating Units", *NBER Working Paper*, No. 19509.
- Spencer, T., O. Sartor and M. Mathieu (2014), "Unconventional Wisdom: An Economic Analysis of US Shale Gas and Implications for the EU", *Study*, No. 02/14, Science Po Institut du Développement Durable et des Relations Internationales.
- SWF Institute (2014), *Newsletter on Sovereign Funds and Public Investors*, Vol. 288, March 2014, Sovereign Wealth Fund Institute.

- The Royal Society and the Royal Academy of Engineering (2012), *Shale Gas Extraction in the UK: A Review of Hydraulic Fracturing*, London.
- USGS (2013), "Groundwater Depletion in the United States (1900-2008)", *Scientific Investigations Report 2013-5079*, US Department of the Interior, US Geological Survey.
- Weber, J. (2012), "The Effects of a Natural Gas Boom on Employment and Income in Colorado, Texas, and Wyoming", *Energy Economics*, Vol. 34, pp. 1580-1588.
- Weiss, J. et al. (2013), *Partnering Natural Gas and Renewables in ERCOT*, The Brattle Group.
- Williams, A. (2008), "New Mexico's Land Grant and Severance Tax Permanent Funds: Renewable Wealth from Non-Renewable Resources", *Natural Resources Journal*, Vol. 48, pp. 719-743.
- World Bank (2006), *Where is the Wealth of Nations?*, Washington, DC.

Glossary

ACA	Affordable Care Act
ARRA	American Recovery and Reinvestment Act
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
BTU	British Thermal Unit
CAPE	Cyclically adjusted price earnings ratio
CBO	Congressional Budget Office
CCAR	Comprehensive Capital Analysis and Review
DEI	Disability Employment Initiative
EIA	Energy Information Administration
EITC	Earned Income Tax Credit
EME	Emerging market economies
EPA	Environmental Protection Agency
FHFA	Federal Housing Finance Agency
FLSA	Fair Labor Standards Act
FMLA	Family and Medical Leave Act
GAO	Government Accountability Office
GDP	Gross Domestic Product
GHG	Greenhouse gas
HAMP	Home Affordable Modification Program
HARP	Home Affordable Refinance Program
IEA	International Energy Agency
ILO	International Labour Organization
MNE	Multinational enterprises
NASBO	National Association of State Budget Officers
PIAAC	Programme for the International Assessment of Adult Competencies
USD	United States Dollar
WTI	West Texas Intermediate

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

The OECD is a unique forum where governments work together to address the economic, social and environmental challenges of globalisation. The OECD is also at the forefront of efforts to understand and to help governments respond to new developments and concerns, such as corporate governance, the information economy and the challenges of an ageing population. The Organisation provides a setting where governments can compare policy experiences, seek answers to common problems, identify good practice and work to co-ordinate domestic and international policies.

The OECD member countries are: Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The European Union takes part in the work of the OECD.

OECD Publishing disseminates widely the results of the Organisation's statistics gathering and research on economic, social and environmental issues, as well as the conventions, guidelines and standards agreed by its members.

OECD Economic Surveys

UNITED STATES

SPECIAL FEATURES: IMPROVING WELL-BEING; MAKING THE BEST OF NEW ENERGY RESOURCES

Most recent editions

Australia, December 2012

Austria, July 2013

Belgium, May 2013

Brazil, October 2013

Canada, June 2014

Chile, October 2013

China, March 2013

Colombia, January 2013

Czech Republic, March 2014

Denmark, January 2014

Estonia, October 2012

Euro area, April 2014

European Union, April 2014

Finland, February 2014

France, March 2013

Germany, February 2012

Greece, November 2013

Hungary, January 2014

Iceland, June 2013

India, June 2011

Indonesia, September 2012

Ireland, September 2013

Israel, December 2013

Italy, May 2013

Japan, April 2013

Korea, April 2012

Luxembourg, December 2012

Mexico, May 2013

Netherlands, June 2012

New Zealand, June 2013

Norway, March 2014

Poland, March 2012

Portugal, July 2012

Russian Federation, January 2014

Slovak Republic, December 2012

Slovenia, April 2013

South Africa, March 2013

Spain, November 2012

Sweden, December 2012

Switzerland, November 2013

Turkey, July 2012

United Kingdom, February 2013

United States, June 2014

Consult this publication on line at http://dx.doi.org/10.1787/eco_surveys-usa-2014-en.

This work is published on the OECD iLibrary, which gathers all OECD books, periodicals and statistical databases. Visit www.oecd-ilibrary.org for more information.

Volume 2014/12
June 2014

OECD *publishing*
www.oecd.org/publishing



ISSN 0376-6438
2014 SUBSCRIPTION (18 ISSUES)
ISSN 1995-3046
SUBSCRIPTION BY COUNTRY

ISBN 978-92-64-20698-4
10 2014 12 1 P



9 789264 206984