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**AUSTRALIAN VALUATION OF SUBSOIL NATURAL RESOURCES AND THEIR INCLUSION IN
PRODUCTIVITY STATISTICS**

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This document has been prepared by Larissa Argento and Derek (Australian Bureau of Statistics - Australia) and will be presented under item 3 of the draft agenda

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AUSTRALIAN VALUATION OF SUBSOIL NATURAL RESOURCES AND THEIR INCLUSION IN PRODUCTIVITY STATISTICS

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Abstract

This paper discusses the methods behind the valuation of subsoil natural resources in Australia, including recent improvements and the introduction of subsoil natural resources into the mining industry productivity measures.

The Australian Bureau of Statistics (ABS) has measured the value of Australia's subsoil natural resources for a number of years. The net present value (NPV) approach is used to value these assets as there are insufficient transactions in subsoil natural resources in Australia to determine market prices.

The valuation of subsoil natural resources in Australia is calculated separately to other mining industry statistics (even within national accounts). Recent improvements have ensured that the results obtained from the subsoil natural resources valuation model and other ABS mining industry statistics are in line with each other.

Previously mining industry productivity estimates calculated by the ABS have excluded subsoil natural resources. Recent improvements to the valuation of subsoil natural resources have meant that improved estimates are now available for use in productivity measures. The inclusion of subsoil natural resources has significantly moderated mining capital services growth and the decline in mining multifactor productivity (MFP).

Introduction

1. The Australian Bureau of Statistics (ABS) has measured the value of Australia's subsoil natural resources for a number of years. Estimates begin in 1988-89 and are published annually in the ABS publication, **Australian System of National Accounts** (cat no. 5204.0).

2. Recent improvements to the valuation of subsoil natural resources have meant that improved estimates are now available for use in productivity measures. Previously mining industry productivity estimates calculated by the ABS have excluded subsoil natural resources.

3. Updated estimates of mining industry productivity will be published in **Estimates of Industry Multifactor Productivity, Australia: Detailed Productivity Estimates** (cat no. 5260.0.55.002) in December 2013, and aggregated productivity measures will be published in **Australian System of National Accounts** (cat no. 5204.0) in November 2013.

4. This paper discusses the methods behind the valuation of subsoil natural resources in Australia, including the recently incorporated improvements and the introduction of subsoil natural resources into the mining industry productivity measures.

Subsoil natural resources valuation

5. Subsoil natural resources are included as a non-financial non-produced asset on Australia's national and sectoral balance sheets as published in **Australian System of National Accounts** (cat no. 5204.0). The valuation of subsoil natural resources in Australia is calculated separately to other mining industry statistics (even within national accounts). A comparison between the results obtained from the subsoil natural resources valuation model and other ABS mining industry statistics is constructed in the validation of results section of this paper.

6. In the ABS there are 27 minerals that are included in the valuation of subsoil natural resources; these are based on **Australia's Identified Mineral Resources** (AIMR) as published by Geoscience Australia and include: antimony, bauxite, black coal, brown coal, cadmium, cobalt, copper, diamonds, gold, iron ore, lead, lithium, magnesite, minerals sands - ilmenite, rutile and zircon, nickel, petroleum products - crude oil, condensate, natural gas and LPG, platinum, rare earths, silver, tin, uranium and zinc. Data by mineral type is presented in **Australian System of National Accounts** (cat no. 5204.0) Electronic Table 62. Value of Demonstrated Subsoil Assets, by commodity.

Concepts

7. Subsoil natural resources are defined in the **System of National Accounts 2008** (SNA 2008) as:

"...those proven subsoil resources of coal, oil and natural gas, metallic minerals or non-metallic minerals that are economically exploitable given current technology and relative prices." (SNA 2008, para.12.17)

8. The ABS has chosen the net present value (NPV) approach to value these assets as there are insufficient transactions in subsoil natural resources in Australia to determine market prices. This method is one of the approaches recommended in SNA 2008 and the **System of Environment and Economic Accounts 2012** (SEEA 2012).

9. SEEA 2012 is a framework for developing statistics about natural resources and ecosystems. It is designed to provide an environmental context for economic decision making. Data produced in line with SEEA 2012 enables an assessment of the impact of economic decisions on the environment and the impact of environmental policies on social and economic development.

10. SEEA 2012 adopts a range of conventions (residence, unit definitions, sector and industry classifications, statistical geography and accounting structure) that are shared with SNA 2008 to make it easier to relate data derived from both frameworks. An example is relating land, energy and water use to industrial production, employment, capital investment and income generation.

11. Both the SEEA 2012 and SNA 2008 frameworks assist in attributing income to a mix of produced and non-produced assets that are used in the capital input mix in the productive process. SEEA 2012 shows that mining net operating surplus can be further decomposed into a return to non-produced

assets ('rents' retained by general government owners), a return to produced assets (income retained by miners from rights to exploit minerals), and a measure of resource depletion (where depletion is analogous to consumption of fixed capital). These accounting relationships are demonstrated later in Figure 1.

12. SNA 2008 recognises economic rents accruing to miners from exercising rights to exploit natural resources. SNA 2008 states that:

"Suppose that a mining company knows the size of the deposit being mined, the average rate of extraction and the costs of extraction of one unit. After allowing for all intermediate costs, labour and the cost of fixed assets used, what is left must represent the economic rent of the natural resource. By applying this to the expected future extractions, a stream of future income can be estimated and from this, using the techniques already described, a figure for the value of the stock of the resource at any point in time." (SNA 2008, para.20.47)

13. SEEA 2012 further elaborates on estimating resource rents from natural resources in mining. SEEA 2012 states that:

"Resource rent is thus derived from standard SNA measures of gross operating surplus by deducting specific subsidies, adding back specific taxes and deducting the user costs of produced assets (itself composed of consumption of fixed capital and the return to produced assets). As noted above, resource rent is composed of depletion and the net return to environmental assets."¹ (SEEA 2012, para5.120)

Methods

14. The NPV approach involves calculating the expected future net income flow generated by the asset, and then discounting that value by an appropriate discount rate over the expected life of the asset. This approach involves estimating the value of net income; gross output (price multiplied by quantity extracted) less costs (including a normal return on produced capital) over a year. The difference is taken to be the equivalent of economic rent. The future income flow is calculated for each year and discounted over the expected mine life to obtain a value in today's dollars. The ABS uses a five-year lagged average to smooth prices, costs and production.

15. Normal returns to produced capital are deducted from economic rent as it represents the returns from the resource only (and not returns on produced capital used to extract the resource). Normal returns on capital should include a reward to cover the cost of risk and uncertainty in exploration and development, and an overall long-term risk premium to cover price volatility and the general level of inflation.

16. In the derivation of real (inflation adjusted) discount rates, the ABS has assumed that a company's decision to commit resources is significantly influenced by costs of borrowing. Consequently, the discount rate chosen has been aimed at reflecting the cost of capital, or the cost of borrowing, to the mining industry. A real rate of discount is appropriate because the future stream of income is expressed in current dollar terms, and the future income flow is calculated on the basis of current income and costs.

¹ In Australia, there are no significant specific subsidies or taxes attributable to the subsoil natural resources. So in Figure 1, specific taxes can be ignored.

Sources

17. Geoscience Australia publishes annual estimates of economically demonstrated resources (EDR) and domestic production of mineral resources in **Australia's Identified Mineral Resources (AIMR)** and **Oil and Gas Resources of Australia (OGRA)**.
18. Production costs are provided by a private consulting firm and are derived using company reported financial information from a sample set of mines and industry trends.
19. Prices are derived from a number of publicly available resources, including the Australian Financial Review and the Bureau of Resources and Energy Economics' (BREE) quarterly publication **Resources and Energy Statistics**.
20. Data on normal returns to produced capital are derived by the ABS using national accounts capital stock estimates, an appropriate discount rate and extraction costs.
21. The discount rate chosen is based upon the Reserve Bank of Australia's (RBA) large business variable lending rate as published in **Statistical Table F5 Indicator Lending Rates**.

Recent improvements

22. There have been a number of initiatives in recent years to improve the quality of subsoil natural resources data. There was a methodological review of the subsoil natural resources valuation model for the 2011-12 release of **Australian System of National Accounts** (cat no. 5204.0). Assumptions regarding the normal return to produced capital were reviewed and updated mineral extraction cost data were included. These resulted in significant revisions to the value of the stock of subsoil natural resources on the balance sheet. The resulting improved methods are now available for inclusion in productivity measures.
23. Mineral extraction costs are provided by a private consulting firm. Revisions to their data are due to a change in their methodology and the incorporation of the latest available company reported financial information. Due to the commercial sensitivity of the data provided, individual commodity costs that were previously published in **Australian System of National Accounts** (cat no. 5204.0) will no longer be published.
24. Normal returns to capital are included in economic rent to cover the cost of risk and uncertainty in exploration and development, and an overall long-term risk premium to cover price volatility and the general level of inflation. The normal rate of return to capital is used to mark up costs. Previously, the normal rate of return to capital was provided by a mineral economics consultancy firm; however, there were concerns that the rate was too low. It is now derived using cost of extraction data (obtained from the consulting firm), mining industry capital stock estimates and an appropriate discount rate.
25. The stock of Australia's subsoil natural resources was valued at \$862.7 billion (AUD) as at June 30th 2012. Subsoil natural resources are the fourth largest non-financial asset on the national balance sheet contributing approximately 10% to total non-financial assets in 2011-12. The current price value of subsoil natural resources has tripled since 2005-06. This increase in value is predominantly driven by price with volume estimates of subsoil natural resources only increasing 23.2% over the same period.

Validation of results

26. The ABS verifies the accuracy of the revised estimates of subsoil natural resources by comparing the results to other mining income data reported by the ABS. Estimates for the value of mining gross operating surplus (GOS) can be constructed from data published in **Australian System of National**

Accounts (cat no. 5204.0). Theoretically, it should have the same result as that derived from the subsoil natural resources model; however, practically it does not, as the estimates are calculated using different data sources and have different scopes. Nevertheless, taking into account these differences, the results should be in line with each other.

27. Figure 1. Relationship between gross operating surplus and capital services flows.

Gross operating surplus	Consumption of fixed capital	Consumption of fixed capital	Capital services of produced assets
	Net operating surplus	Return to produced assets	Capital services of non-produced assets
		Return to non-produced assets	
		Depletion	

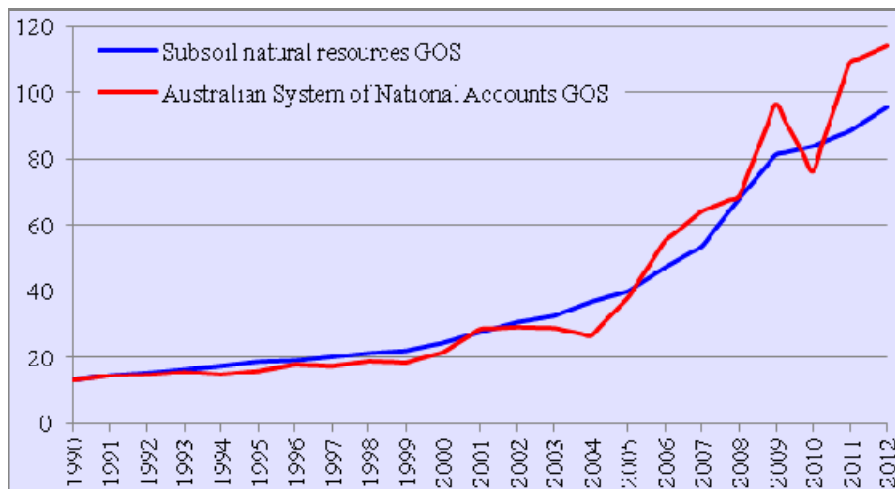
28. Mining GOS estimates as shown in Figure 2, can be modelled from data in the subsoil natural resources model. The data below includes the change made to the normal rate of return to capital and the updated extraction cost data.

29. Figure 2. Mining GOS derived from the subsoil asset estimates, 2005-06 to 2011-12.

		2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Return to produced assets	\$m	10,586	12,389	15,046	17,121	19,451	21,564	25,602
<i>plus</i> Return to non-produced assets	\$m	16,478	18,987	27,639	32,481	33,153	33,750	32,793
<i>plus</i> Resource depletion	\$m	7,027	7,409	8,350	11,803	9,377	8,888	9,381
<i>plus</i> Consumption of fixed capital	\$m	13,098	14,783	16,891	19,776	21,854	24,160	27,756
Gross Operating Surplus	\$m	47,189	53,568	67,926	81,180	83,835	88,361	95,532

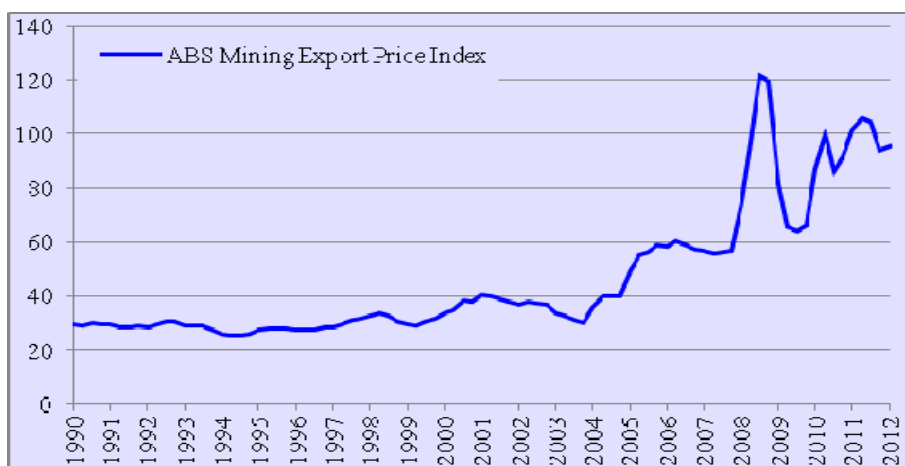
30. The ABS publication **Australian System of National Accounts** (cat no. 5204.0) contains data on mining industry value added (IVA) and compensation of employees (COE) from which gross operating surplus (GOS) can be constructed. The scope of this publication is greater than the scope of the modelled subsoil natural resource GOS estimates, as it includes exploration and mining support services. From 2005-06 to 2011-12, exploration and mining support services makes up on average 8.0% of the **Australian System of National Accounts** (cat no. 5204.0) mining IVA. Therefore it is expected that the GOS estimates derived from the subsoil natural resources estimates should be lower than the **Australian System of National Accounts** (cat no. 5204.0) estimates by around 8.0%. From 2005-06 onwards, the subsoil natural resources estimates are in line with expectations, on average 8.2% below the **Australian System of National Accounts** (cat no. 5204.0) GOS estimates.

31. Figure 3. Mining GOS comparison (\$billion), 1989-90 to 2011-12.



32. The other main differences are due to the subsoil natural resources model using five-year averages of prices, costs and production, which has subdued the volatility of subsoil natural resources GOS in recent years. Price movements that the subsoil natural resources model has smoothed can be seen in Figure 4. Mining Industry Export Price Index from ABS publication **International Trade Price Indexes** (cat no. 6457.0). Other differences are due to **Australian System of National Accounts** (cat no. 5204.0) estimates covering all minerals within the SNA 2008 production boundary, and the subsoil natural resources estimates only including the 27 minerals listed earlier.

33. Figure 4. ABS Mining Export Price Index, 1989-90 to 2011-12.²



34. The review has also improved the suitability of resource rent (return to natural capital plus depletion) as an indicator of capital services since updated estimates of resource rent now correspond more closely with mining income data from alternative sources. When estimated in real terms, resource rent provides an indicator of capital services that can be used for productivity estimation.

² Reference year 2011-12

Productivity Measures

35. Productivity statistics aim to measure technical progress or the efficiency of production. In practice, they measure the difference between the growth in the volume of output and the growth in the volume of inputs, which reflects more than just technical progress. Other factors include economies of scale, reallocation of inputs, changes in human capital, variations in capacity utilisation, climatic events and measurement error.

36. For mining industry productivity estimates, subsoil natural resources are not currently included as inputs in the production process, resulting in a significant under coverage of the inputs mix. This omission has drawn attention amongst analysts. Several recent Australian studies indicate that subsoil natural resources have a significant influence on mining productivity growth. For example, Loughton (ABS, 2011), Zheng (2009), and Topp et al (2008) show that the decline in mining multi factor productivity (MFP) over the last decade is significantly moderated when natural resources are included. Since natural resource input grows relatively slowly compared to real growth in other types of capital, the overall growth in mining capital services is moderated. This reduction in real capital services growth overflows into the MFP residual, moderating the decline.

37. The ABS has a productivity research program and regularly engages with key users to improve the estimates and bring MFP closer to its conceptual definition. There is a growing consensus among analysts (including the authors mentioned above) that inclusion of subsoil natural resources will improve the interpretability and overall fitness for purpose of productivity measures for both mining as well as productivity aggregates.

38. The improved subsoil natural resources estimates and updated guidance from international standards, SNA 2008 and SEEA 2012 have meant that the ABS is now in a position to include subsoil natural resources in its published productivity statistics.

Estimation of mining multifactor productivity

39. For productivity estimation, the under coverage in mining is addressed by adding the return to non-produced assets plus resource depletion component as this represents the resource rent (RR) needed to estimate the capital service flows of the subsoil natural resources.

40. With the inclusion of subsoil natural resources, the mining industry value added production function can be written as:

$$V_t = A_t F(K_t, N_t, L_t)$$

Where

- V_t is real value added at time t
- A_t is multifactor productivity at time t
- F is the production function at time $t = 0$
- K_t is real capital input at time t
- N_t is real natural resources input at time t
- L_t is real labour input at time t

41. The real natural resource input is estimated by deflating the aggregate nominal resource rent (RR) by the natural resources implicit price deflator (IPD) (the ratio of current price and volume estimates recorded on the national balance sheet).

$$(1) \quad N_t = \frac{RR_t}{IPD_t}$$

42. The natural log growth in the natural resources index can then be expressed as $\ln\left(\frac{N_t}{N_{t-1}}\right)$. Thus, growth in mining MFP can be written as:

$$(2) \quad \ln\left(\frac{A_t}{A_{t-1}}\right) = \ln\left(\frac{V_t}{V_{t-1}}\right) - \bar{S}_{K,t} \ln\left(\frac{K_t}{K_{t-1}}\right) - \bar{S}_{N,t} \ln\left(\frac{N_t}{N_{t-1}}\right) - \bar{S}_{L,t} \ln\left(\frac{L_t}{L_{t-1}}\right)$$

Where

$\ln\left(\frac{A_t}{A_{t-1}}\right)$	is the growth in mining MFP
$\ln\left(\frac{V_t}{V_{t-1}}\right)$	is the growth in real mining gross value added
$\bar{S}_{K,t}$	is the capital income share (two period average)
$\ln\left(\frac{K_t}{K_{t-1}}\right)$	is the growth in real capital services
$\bar{S}_{N,t}$	is the natural resources income share (two period average)
$\ln\left(\frac{N_t}{N_{t-1}}\right)$	is (again) the growth in the natural resources index
$\bar{S}_{L,t}$	is the labour income share (two period average)
$\ln\left(\frac{L_t}{L_{t-1}}\right)$	is the growth in real labour services, and can be further partitioned into hours worked and labour composition

43. Solving the weight for natural resources index, $\bar{S}_{N,t}$ is less straightforward. Since real productive capital stock and rental prices are not available for natural resources, it is not practicable nor desirable to combine N_t into the aggregation of K_t . Instead, N_t is introduced as a separate variable with its weight $\bar{S}_{N,t}$ based on the 'economic rent' that is attributable to non-produced assets and resource depletion. SEEA 2012 states that:

"Resource rent and the net return to environmental assets can be derived within the national accounts framework through a focus on the operating surplus of extracting enterprises. In this context the operating surplus earned by an enterprise is considered to comprise a return for the investment in produced assets and a return to the environmental assets used in production." (SEEA 2012, para.5.117)

44.

The approach the ABS has chosen is to use the allocations as described in Figure 1 above. That is, the weight of subsoil natural resources is represented by the ratio of the return to non-produced assets plus resource depletion divided by a variation of mining total factor income represented by the subsoil Mining GOS plus compensation of employees.

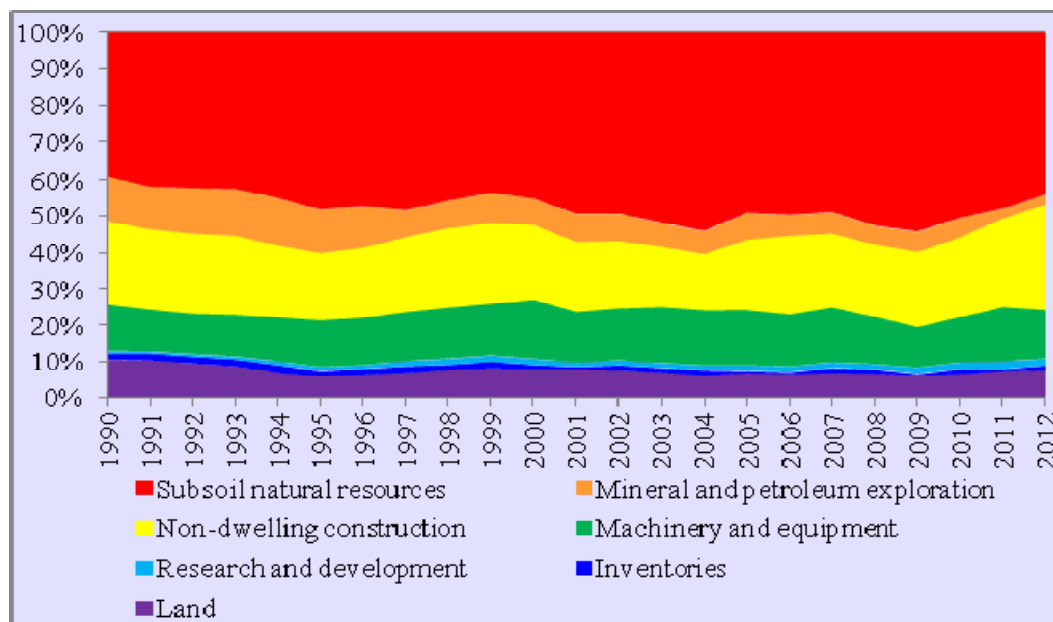
$$(3.) \quad \bar{S}_{Nt} = \frac{\text{return to non produced assets+depletion}}{\text{Mining GOS+compensation of employees}}$$

$$(4.) \quad \bar{S}_{Kt} = \frac{\text{return to produced assets+consumption of fixed capital}}{\text{Mining GOS+compensation of employees}}$$

$$(5.) \quad \bar{S}_{Lt} = \frac{\text{compensation of employees}}{\text{Mining GOS+compensation of employees}}$$

45. Figure 5 below, shows the weights for each of the component capital services indices and subsoil natural resource index over time. On average, almost half (44%) of the weight is attributed to subsoil natural resources. Previously, this share was allocated proportionally to capital assets. The weight peaked at around 54% at the height of the mining boom, driven by unprecedented commodity prices that have subsequently declined since the start of the global financial crisis (GFC). Since 2005-06, the weight of non-dwelling construction (including ownership transfer costs) exceeded 20%, rising to 29% in 2011-12, reflecting significant investment in new infrastructure in recent years. Also noteworthy is the persistent decline in the share attributable to mineral exploration, which is now less than 3%. Capital service weights can be found in appendix 1.

46. Figure 5. Capital services and subsoil natural resources aggregation weights (%) 1989-90 to 2011-12.



Productivity growth accounts

47. Equation (2.) can be re-expressed with $\ln\left(\frac{V_t}{V_{t-1}}\right)$ on the left hand side to show the traditional growth accounting expression of the weighted contribution of the growth in inputs and MFP to mining value added growth. The growth accounts are presented in Figure 6 separately for the last two decades, along with average overall growth for each decade.

48. Figure 6. Mining productivity growth accounts, 1992-93 to 2011-12.³

Financial year ending	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	1992 to 2002
Output growth (GVA)	0.99	1.74	6.91	8.66	1.30	3.36	-0.58	4.64	7.86	0.37	3.53
Contribution to output growth:											
Capital services	1.41	1.15	1.15	1.79	1.91	2.20	1.56	0.42	0.05	0.72	1.24
Natural resources (subsoil)	1.38	3.45	-0.15	-0.32	0.16	0.46	-0.11	1.30	2.41	-1.23	0.74
Hours worked	-0.74	1.88	-0.75	-0.26	-0.08	-0.52	-0.17	-1.49	-0.46	-0.05	-0.27
Labour composition	0.11	0.11	0.11	0.10	0.21	0.18	0.19	0.15	0.13	-0.01	0.13
MFP	-1.17	-4.85	6.56	7.35	-0.90	1.04	-2.05	4.26	5.74	0.94	1.69
Financial year ending	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2002 to 2012
Output growth (GVA)	0.66	-2.96	5.08	1.89	8.14	2.00	3.00	7.57	-1.44	6.52	3.05
Contribution to output growth:											
Capital services	1.00	1.17	1.29	3.35	3.84	3.98	4.45	3.61	4.68	7.82	3.52
Natural resources (subsoil)	3.43	0.40	-4.51	-2.30	0.48	3.05	-10.7	2.41	-0.72	-7.14	-1.56
Hours worked	2.26	2.21	1.68	3.16	1.08	1.12	2.38	0.62	2.90	3.89	2.13
Labour composition	0.00	0.00	0.00	0.00	0.02	0.03	0.02	0.04	0.03	0.04	0.02
MFP	-6.02	-6.74	6.63	-2.33	2.71	-6.18	6.81	0.90	-8.32	1.91	-1.06

49. In the first decade ending 2001-02 output growth averaged 3.53%. Almost half of this was represented by MFP of 1.69%. Capital services contributed 1.24% and subsoil natural resources contributed 0.74%, partly offset by a negative contribution of -0.27% from hours worked.

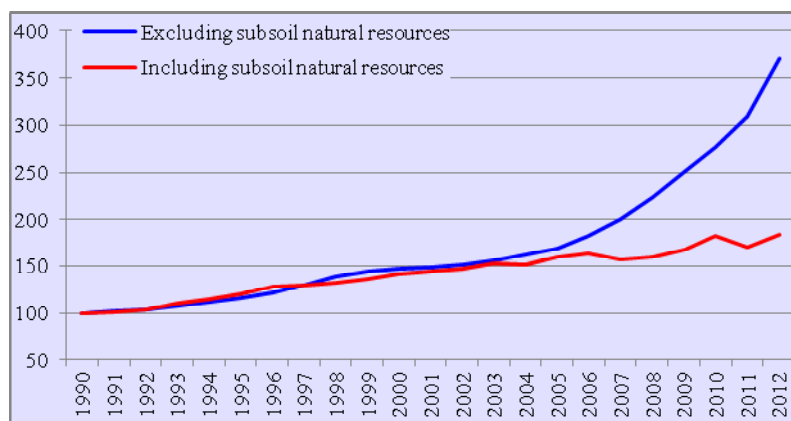
50. In the second decade, output growth was somewhat lower, averaging 3.05%. Capital services growth contributed 3.52% (exceeding output growth) reflecting the ramping up of new mining capital expenditure and increased capital deepening (capital to labour ratio). The mining boom attracted significant labour services: hours worked contributed significantly to output growth (2.13%). These contributions were offset by a decline in subsoil natural resources of -1.56% and MFP of -1.06%. Subsoil natural resources yearly contribution was volatile in price through the GFC period, particularly in 2008-09, affecting both the value weight and derived real growth in the subsoil index. The residual value of MFP was also negative, contributing -1.06% on average.

³ Growth in natural log x 100

Revisions to capital services and multi factor productivity

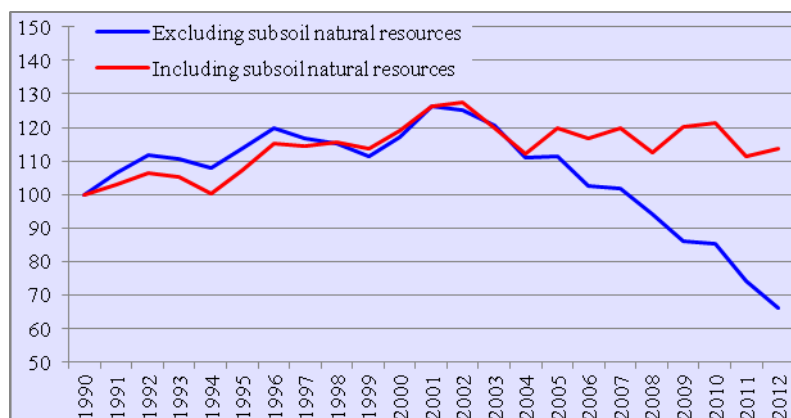
51. To facilitate reporting of revisions to capital services, it is necessary to combine the new capital services index and subsoil natural resources index using their relative income shares. Most of the revisions due to the method change occur after the 2003-04 growth cycle peak. Growth in mining capital services is moderated significantly due to the inclusion of subsoil natural resources, from 10.2% average annual growth since 2003-04 to 2.2% average growth. These results can be seen below in Figure 7.

52. Figure 7. Mining industry capital services index, 1989-90 to 2011-12.⁴



53. The decline in the Mining MFP is also moderated significantly, from -6.4% on average annually to -0.5% annually since 2003-04. These results can be seen below in Figure 8.

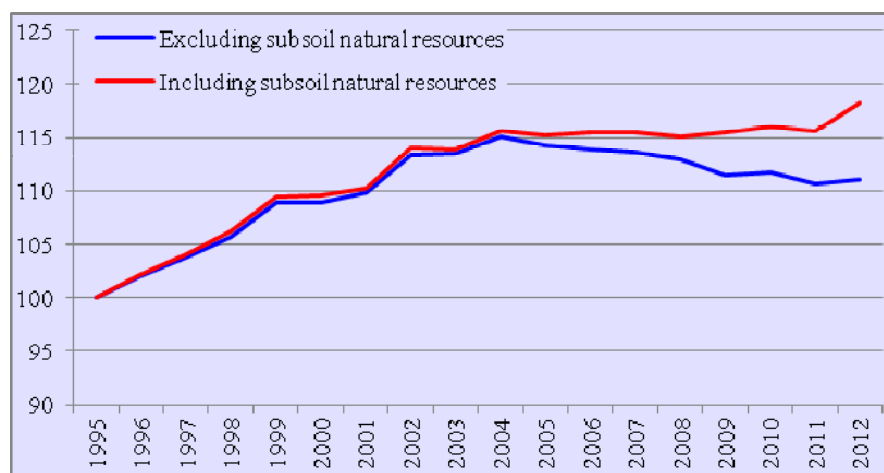
54. Figure 8. Mining industry multi factor productivity index, 1989-90 to 2011-12.⁵



55. The aggregate impact for the market sector MFP is also significant, from -0.3% average annual decline since 2003-04 to 0.4%. That is, the revised MFP estimates indicate low positive growth (on average) rather than a productivity decline (MFP still declines in 2004-05, 2007-08 and 2010-11). These results can be seen below in Figure 9.

⁴ Reference year 1989-90

⁵ Reference year 1989-90

56. Figure 9. Market sector multi factor productivity index, 1994-95 to 2011-12.⁶

Conclusion

57. In Australia subsoil natural resources are valued using the net present value (NPV) approach as there are insufficient transactions in subsoil natural resources in Australia to determine market prices. The stock of subsoil natural resources are calculated separately to other mining industry statistics (even within national accounts). Recent improvements to the cost of extraction and normal rate of return to capital have ensured that the results obtained from the subsoil natural resources valuation model and other ABS mining industry statistics are in line with each other. The improved subsoil natural resources estimates are available for inclusion in mining productivity estimates.

58. Previously mining industry productivity estimates excluded subsoil natural resources. The ABS has found that mining capital services growth is significantly moderated when natural resources is included, moderating the decline in mining multifactor productivity (MFP). The decline in mining MFP cannot solely be explained by recognising natural resources as a factor of production: other factors such as capital lags associated with investment in new infrastructure have also contributed to the decline. As a result of the inclusion of subsoil natural resources, aggregate decline in MFP is revised to a small positive growth in most years since the 2003-04 growth cycle peak.

⁶ Reference year 1994-95

Appendix 1

Capital Services Weights

Financial year ending	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Subsoil natural resources	42.6	45.0	48.2	47.3	48.4	45.7	43.7	45.2	49.4	49.4
Land	8.7	7.0	5.9	6.5	6.9	7.6	8.2	7.9	7.8	7.5
Inventories	1.8	2.1	1.4	1.5	1.8	1.5	1.7	1.2	0.7	1.4
Research and development	0.8	0.9	1.0	1.0	1.3	1.6	1.7	1.6	1.2	1.3
Machinery and equipment	11.7	12.3	13.1	13.2	13.7	14.3	14.4	16.5	14.1	14.5
Non-dwelling construction ⁷	21.7	19.9	18.6	19.4	20.6	21.7	22.0	20.4	19.3	18.6
Mineral and petroleum exploration	12.7	12.9	11.8	11.2	7.3	7.6	8.3	7.3	7.5	7.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Financial year ending	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Subsoil natural resources	52.0	54.2	49.2	49.7	49.0	52.8	54.3	50.6	48.0	44.0
Land	7.0	6.3	6.8	6.6	6.9	6.7	6.2	6.6	7.3	7.6
Inventories	1.2	1.3	0.5	0.4	1.3	1.1	0.3	1.3	0.6	1.3
Research and development	1.3	1.3	1.5	1.5	1.5	1.4	1.7	1.8	2.0	1.8
Machinery and equipment	15.6	15.4	15.4	14.6	15.3	13.2	11.3	12.7	15.2	13.6
Non-dwelling construction ⁸	16.7	15.5	19.4	21.6	20.2	19.9	20.8	22.0	24.2	28.8
Mineral and petroleum exploration	6.2	6.1	7.2	5.6	5.8	4.9	5.3	5.1	2.7	2.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

⁷ Includes ownership transfer costs

⁸ Includes ownership transfer costs

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