ISSN 2432-9746

人文・社会科学研究

東京国際大学大学院

第 3 号

論　　文

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東京国際大学大学院

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資産除去債務に関する一考察
――資産負債の両建処理による会計基準の問題点を中心に――

勝　又　　均

A Study on Accounting for Assets Retirement Obligations
—From the Perspective of Liability On-Balanced—

Hitoshi Katsumata

Abstract

Historically, many entities have accounted for retirement obligation costs as a part of depreciation. However, after the accounting for the Assets retirement obligations(ARO) is published, entities must recognize ARO liability in the period in which it was incurred. And an asset equal to the initial liability is added to the balance sheet, and depreciated over the life of the asset. The result is an increase in both assets and liabilities. We studied the difference between these accounting methods.

キーワード：資産負債アプローチ，減価償却，分配可能利益計算，取得原価概念，将来キャッシュ・アウトフロー，期間損益計算

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はじめに

企業が負っている環境リスクや環境負債は，それが財務諸表に明確に開示されていなければ，投資家に誤った意思決定をさせてしまう可能性がある。環境負債に関しては，資産除去債務に関する会計基準が制定される以前も様々な引当金を設定することで，企業は将来発生する債務に備えることができ，またその債務を財務諸表に計上することで外部利害関係者に対しても情報提供を行うことはできた。しかし，基準制定以前における環境負債は，資産除去債務のように認識範囲の限定はされていなかった。そのため，環境負債は，その範囲は広いうえ，不確実性が大きく左右し，引当金設定に至ることができず，財務諸表に反映させることができないこともあった。

資産除去債務は，資産除去債務会計基準において法令又は契約により義務づけられるものに限定されるため，環境負債全体からすれば範囲は小さいものになる。それでも，業種や企業規模によっては，多額の除去費用を除去債務として負債に計上しなくてはならない場合もあるため，財務諸表に極めて重要な影響を及ぼすものである。

これらの問題を会計上で明確に認識し，顕在化させることは，利害関係者に対しても有用な情報になるのと同時に，将来発生する費用を事前に把握して財務諸表に明示し，その対応を促進させ対策を導いていくことは，企業にとってもゴーイングコンサーンの観点から必要なものと考える。

日本の資産除去債務会計基準は，国際的な会計基準のコンバージェンスの影響を受け，資産除去債務に対応する除去費用の会計処理として，引当金処理ではなく，資産負債の両建処理を採用した。この資産除去債務の会計処理として採用された資産負債の両建処理は，資産除去債務について発生時にその全額を負債として認識し，かつ，資産除去債務に対応する除去費用を資産計上し，減価償却により費用配分するものである。

1990年代以降，各国の会計思考もその利益観は，収益費用アプローチから資産負債アプローチに移っており，資産負債の両建処理も資産負債アプローチの観点から採用されたものといえる。しかし，資産負債の両建処理についていえば，負債をストックで捉えているものの，借方資産については減価償却を通じて費用配分を行う。これは，収益費用アプローチの観点における損益計算であり，それゆえ，資産負債の両建処理は混合会計（混合アプローチ）であるとの指摘もある。今後も新たな会計基準が制定される際には，資産除去債務の会計基準が抱えているのと同じような問題を考え，構築していかなくてはならないことが想定される。その意味で，資産除去債務の会計基準を考察することは重要であると考える。

以上の問題意識から，資産除去債務の会計処理及び開示方法として，資産負債の両建処理が最善なものであるのか，論理的矛盾を内包していないか，という考えに基づき資産除去債務を考察していきたい。

この「資産負債の両建処理」という会計処理方法の採用に関しては，資産除去債務自体の負債性及び資産除去債務に対応する除去費用の資産性を検討する必要があると考える。特に，除去費用という将来支出する費用を付随費用との同質性から資産性があるとし，資産として処理することから生じる問題点を考察していく。

そして，資産負債の両建処理に替わる会計処理方法が存在しないか検証を行っていく。

Ⅰ．資産除去債務会計基準の概要と論点

1．資産除去債務の定義および認識範囲

資産除去債務の定義は「資産除去債務に関する会計基準」（企業会計基準第18号，以下基準第18号という）において「有形固定資産の取得，建設，開発または通常の使用によって生じ，当該有形固定資産の除去に関して法令または契約

で要求される法律上の義務およびそれに準ずるものをいう」とされている。

松本徹氏によれば，この定義について，認識範囲に関し3つの視点から考察することができるとし，以下のように分析している。[1)]

一つ目は「法律上の義務およびそれに準ずるもの」である。「法律上の義務に準ずるもの」とは，債務の履行を免れることがほぼ不可能な義務を指し，法令または契約で要求される法律上の義務とほぼ同等の不可避的な義務が該当する（基準第28項）。

二つ目は，「通常の使用」である。「通常の使用」とは，有形固定資産を意図した目的のために正常に稼働させることをいい，有形固定資産を除去する義務が，不適切な操業等の異常な原因によって発生した場合には，資産除去債務として使用期間にわたって費用配分すべきものではなく，引当金の計上や「固定資産の減損に係る会計基準」の適用対象とすべきものと考えられる。

三つ目は，「除去」である。この場合，「除去」には，売却，廃棄，リサイクルその他の方法による処分等が含まれるが，転用や用途変更は企業が自ら使用を継続するものであり，当該有形固定資産を用役提供から除外することにはならないため，具体的な態様には含めないものとされ，遊休状態になる場合は，資産除去債務としてではなく，必要に応じて減損処理が行われることになる（基準第3項（2））。

資産除去債務の認識範囲については，後述するⅡ章　資産除去債務の負債性分析の中でも，法的債務と推定的債務の観点から考察する。

2. 資産除去債務の会計処理

ⅰ．資産負債の両建処理と引当金処理

基準第4項及び同第7項における規定は，資産除去債務を「発生した時に負債として計上」し「当該負債の計上額と同額を，関連する有形固定資産の帳簿価額に加える」という2点から資産除去債務の会計処理を「資産負債の両建処理」により行うことを求めている。

松本氏によれば，上記2点に関して，以下に説明を加えることができる。[2)]

まず「発生した時に負債として計上」とは，それまで類似する除去費用に適用されていた「引当金処理」は，「その時点までに発生していると見積もられる額を計上」するものであった。これに対し，「資産負債の両建処理」は，資産除去債務の全額を「発生した時に負債として計上」する。そのため「資産負債の両建処理」を採用する根拠であることを指す。

基準第7項における「資産除去債務に対応する除去費用」は，同第41項において，「当該有形固定資産の取得原価に含めることにより，当該資産への投資について回収すべき額を引き上げることを意味する」と規定される。すなわち，資産負債の両建処理により資産除去債務に対応する除去費用を取得原価として資産に含めることで，より回収可能額の算定を明確に示すことができる。よって，投資家への有用な情報を提供することが可能であるとしている。

しかし一方で，基準第33項においては，「引当金処理に関しては，有形固定資産に対応する除去費用が，当該有形固定資産の使用に応じて各期に適切な形で費用配分されるという点では，資産負債の両建処理と同様であり，また，資産負債の両建処理の場合に計上される借方項目が資産としての性格を有しているのかどうかという指摘も考慮すると，引当金処理を採用した上で，資産除去債務の金額等を注記情報として開示することが適切ではないかという意見もある」としている。このことは，まさに企業会計基準審議会（Accounting Standards Board of Japan以下ASBJという）が資産負債の両建処理における除去費用の資産性に疑義を有しながらも採用に踏み切ったことを明確に示すものである。またこれに関連して除去費用の配分方法として減価償却が引当計上などと比較して，果たして適切なのかという点も検討すべき事項である。

ⅱ．資産負債の両建処理の根拠

「資産・負債の両建計上を正当化する論拠は，除去債務を資産取得にかかる未払いの付随費用と解釈し，投資活動とくに資産活動に不可避なライフサイクルコストを資産計上すること」[3]という指摘があるように，ライフサイクルコストの考え方が取得原価に対して適用されたとみることができる。

引当金処理と資産負債の両建処理という2つの会計処理による差異は，期間損益計算への影響という点では大きくない。有形固定資産の当初測定時に，除去債務の全額を貸借対照表に計上するか否かという点で，貸借対照表に大きな影響がある。資産・負債の両建て計上を正当化する論拠は，除去債務を資産取得にかかる未払いの付随費用と解釈し，投資活動とくに生産活動に不可避なライフサイクルコストを資産計上することで，投資規模を明示すること，および資産除去時に必要な除去費用を，事業活動当初より負債に計上することで経営者の社会的義務を明示することとなり，当該会社への投資意思決定に役立つ情報が提供されるとするものである。[4]

資産負債の両建処理においては，資産除去債務に対応する除去費用は，資産除去債務を負債として計上したときに，当該負債の計上額と同額を，関連する有形固定資産の帳簿価額に加えることになっている。一方，資産負債を両建することに関しては，負債の定義に基づいて負債の発生が認識されることから，負債の認識アプローチとして，ストックの認識方法がとられていると言える。

このことから，資産負債の両建処理は，環境負債の情報開示の観点から評価することができる。資産除去債務の発生時に将来の除去費用について資産負債の両建処理を行うことで，負債と資産を貸借対照表に表示するが，当初計上時には期間損益計算に対する影響はない。その後の会計処理において期間損益計算の観点から期間配分の思考を取り入れ各期に費用配分するのである。これは，資産効率の観点からも有用と考えられる情報を提供できるものであり，費用配分を通じて期間損益を適正に算定できることが特徴である。これらの特徴から，資産負債の両建処理は，損益計算書における期間損益計算と貸借対照表における情報提供との両立を図っているものと理解することができる。

ⅲ．資産負債の両建処理の問題点
――資産負債アプローチと収益費用アプローチから――

資産負債の両建処理は「負債性の観点から当該資産除去債務が負債に計上され」，その負債と同額を関連する有形固定資産の帳簿価額に加えて資産計上することから，資産負債アプローチを採用しているものと考えられる。引当金処理は「当期の負担に属する繰入額に対応する貸方項目」「費用性の観点から計上される」と解される。さらに除去費用もその都度見積もって費用計上されることからも，収益費用アプローチとして捉えられていることがわかる。

佐藤氏によれば，資産負債の両建処理は「負債計上の側面では，資産負債利益観の観点から支出義務というストックの認識を求めながら，損益計算の側面では，収益費用利益観の観点から資産除去費用を有形固定資産の使用期間全体へ配分するという配分原理が働いている混合利益観である」[5]とし，これが資産負債の両建処理の最大の特徴であると指摘している。

また，松本氏は，資産負債の両建処理は資産除去債務という負債について「資産負債中心観の本来あるべき公正価値会計に忠実に計上することを求めながらも，そのまま損失として認識せず除却費用を資産計上し減価償却により費用配分するという損益計算における期間費用の変動回避をもつ混合会計である。」[6]とし，総じて「財政状態計算（資産負債アプローチ）と費用配分思考に基づく損益計算（収益費用アプローチ）の「混合会計」に陥っている。」[7]と指摘している。

両者の指摘は，資産除去債務の負債計上についてのものではなく，除去費用を資産計上し減

価償却により費用配分することに，資産負債アプローチとしての一貫性が欠如していることを指摘するものである。

「資産負債アプローチに基づく資産負債の両建処理を行うことは，金額的にも概念的にも不確実な負債が計上されることになり，また，その負債の相手項目を資産に上乗せすることから，資産の概念も変質しかねず，金額的にも不確実なものが計上されることになる。さらに，その資産を減価償却するとなれば，費用の金額も不確実なものになる。」[8] との指摘がある。この指摘は，資産負債の両建処理を行うと，これまで会計が作り上げてきた資産概念，負債概念，さらに費用概念をも崩しかねないと危惧するものと受け取れる。

3. 資産除去債務の国際比較

ⅰ．米国会計基準との比較

米国の財務会計基準書（Statement of Financial Accounting Standards以下SFASという）第143号（para.2）の規定によれば，長期性資産の取得，建設または開発および通常の営業活動から発生する有形長期性資産の除去に係る法的債務に対して，同規定を適用する。ただし，SFAS第143号は約束的禁反言の原則[9] に基づく約束，すなわち推定的債務も積極的に法的債務として位置付けているのに対し，日本基準における「法律上の義務に準ずるもの」は，法律上の義務とほぼ同等の不可避的な債務等に制限されているため，資産除去債務の範囲は，米国基準の方が若干広く適用されるといえる。

また，SFAS第143号では，将来キャッシュ・フローに重要な見積りの変更が生じた場合には，その調整額に適用する割引率は，キャッシュ・フローが増加する場合には，増加部分については新たな負債の発生と同様のものとして，その時点の割引率を適用し，反対にキャッシュ・フローが減少する場合には，負債計上時の割引率を適用することとしている。

資産除去債務の当初測定後の測定（事後測定）では，時の経過による変動と，当初見積もった割引前キャッシュ・フローの時期・及び金額の改訂による変動がある。企業は，見積キャッシュ・フローの時期又は金額の双方の改訂から生じる変動を測定する前に，時の経過による変動を当該負債の帳簿価額に反映させる。期首の負債金額に利息法を採用し，時の経過による変動（増加）は，営業費用として認識する（SFAS143　para.14）。この場合，当該変動額を測定するために使用する利率は，負債が当初測定されたときのリスクフリーレートに信用リスクを調整した利率とされている。

当初見積もった割引前キャッシュ・フローの時期又は金額の改訂から生じる変動額は，資産除去債務の帳簿価額を増減させ，同時に，関連する長期性資産の帳簿価額の一部として資産化された資産除去コストを増減させる（SFAS143 para.15）。[10]

将来キャッシュ・フローの見積りに変更から生じる調整を資産除去債務に係る負債及び関連する有形固定資産の帳簿価額に加減して，減価償却を通じて残存耐用年数にわたり費用配分を行う方法をプロスペクティブ・アプローチ[11] といい，日本基準においても採用されている。

ⅱ．国際会計基準との比較

国際会計基準では，資産除去債務は国際会計基準（International Accounting Standards以下IASという）第16号（固定資産に関する会計基準）に規定されている。資産除去債務の日本基準は，国際財務報告基準（International Financial Reporting Standards以下IFRSという）をベースにして策定されているため，IFRSとの大きな乖離が生じるはずはないが，差異はいくつか見られ，その差異は無視できるほど小さくはない。以下五つの相違点を挙げてみる。

まず，資産除去債務の範囲について，日本基準では，「法令または契約で要求される法律上の義務及びそれに準ずるもの」となっているため，法的債務と契約上の義務までがその範囲と解されるが，IFRSでは法定債務などのほか推定的債務（Constructive Obligation）も含むと

されている。推定的債務とは，企業が外部者に対し，ある債務を受託することを表明している場合などを指す。

これに対し，IFRSが適用されると，企業が何らかの形で耐用年数到来時に解体撤去を明示し，外部に公表している場合には，推定的債務に該当し，資産除去債務の追加計上が必要となる可能性がある。

次に，資産除去債務の見直しについて差異が見られる。日本基準では，資産除去債務の見直しについては重要な見積りの変更時のみとなっている。これに対し，IFRSでは毎期最善の見積りを行う必要がある。国際会計基準審議会（International Accounting Standards Board以下IASBという）は，期待キャッシュ・フローとともに，割引率も毎期変更する「フレッシュ・スタート法」を採用している。

3点目は，割引率の差異。割引率については日本基準では，「貨幣の時間価値を反映した無リスクの税引き前の利率とする」としている。無リスクはリスクフリーレートといわれ，元利金の支払いが保証された預貯金や国債などの金融商品の利回りのことをいう。これに対しIFRSでは直近の市場金利を反映した割引率，すなわち信用リスク調整後割引率を用いる必要がある。

また，割引率の見直しについても日本基準では，将来キャッシュフローの見直しを行った際に割引率の見直しが必要とされている。

これに対し，IFRSでは毎期見直しを行う必要がある。つまりIFRSでは，資産除去債務に適用される割引率は直近の市場を基礎とするため，割引率は毎期見直すことが求められている。（フレッシュ・スタート法）

4点目は，調整額（利息費用に相当）の損益計算書での表示の相違である。日本基準では，資産除去債務に関連する有形固定資産の減価償却費（営業費用）と同じ区分に含めて表示する。これに対し，IFRSでは財務費用（営業外費用）として表示する。

最後の相違点としては，日本基準では電力会社のような公共性の強い企業に対し，例外的な措置を適用する規定が設けられているが，IFRSではこうした規定は見られないことが挙げられる。[12)]

図表 1-1　資産除去債務の日本基準・国際会計基準・米国会計基準の主な違い

	日本基準	国際会計基準	米国会計基準
資産除去債務の範囲 （詳細な分析はⅡ章参照）	法的債務 （法律上の義務） 契約上の義務 （法律上の義務に準ずるもの）	法定債務， 推定的債務 （約束的禁反言の原則に基づく債務も含む）	法的債務， 推定的債務 （約束的禁反言の原則に基づく債務も含む）
資産除去債務の見積りと見直し	割引前将来キャッシュフローに重要な見積りの変更が生じた場合	毎期，最善の見積りを行う（フレッシュ・スタート法）	割引前将来キャッシュフローに重要な見積りの変更が生じた場合
割引率	リスク・フリー・レート（無リスク割引率）	信用リスク調整後割引率（直近の市場金利を反映した割引率）	信用リスク調整後リスク・フリー・レート
割引率の見直し	将来キャッシュフローの見直しを行ったとき	毎期見直し（フレッシュ・スタート法）	将来キャッシュフローの見直しを行ったとき
時の経過による調整費の損益計算書の表示	減価償却費（営業費用）	財務費用（営業外費用）	営業費用

（出所）筆者作成

Ⅱ．資産除去債務の負債性分析

1．法的債務と推定的債務分析

ⅰ．負債の定義と債務の範囲

アメリカ財務会計基準審議会（Financial Accounting Standard Board以下FASBという）概念書によれば，負債とは「過去の取引または事象の結果，特定の経済主体が他の経済主体に対して，将来，資産を移転するかまたは用役を提供するという現在の債務から生じる，発生の可能性の高い将来の経済的便益の犠牲である」と定義されている。

IASBの概念フレームワークでは，負債とは，「過去の事象の結果，経済主体に生じる現在の債務であり，当該債務の決済に際して経済的便益に相当する資源が当該主体から流出すると予想されるものをいう」と定義されている。

日本においては「財務会計の概念フレームワーク」（ASBJ，2006a）のなかでは，負債とは「過去の取引または事象の結果として，報告主体が支配している経済的資源を放棄もしくは引き渡す義務，またはその同等物をいう」と定義されている。

上記の負債の定義に共通することは，①過去の取引または事象に起因すること，②特定の主体が負担する債務であること，③現在の債務を負担することにより将来に経済的便益・経済的資源が外部に流出することであり，この3つが，負債の主な特徴であるといえる。

そして，上記②の債務の範囲が重要であり，債務の概念をどこまで捉えるかによって，資産の範囲が決まってくる。

IASBによれば，債務とは「特定の方法によって実行または履行する義務または責任であり，債務は，通常の取引慣行，慣習及び良好な取引関係を維持し，または公正とみなされるように行動したいという要望からも生じる」としていることから，法定債務[13]だけでなく，推定的債務[14]も含まれると考えられる。

また，FASBにおいては，債務とは「契約，約束，道徳上の責任等によって法的または社会的に課せられた義務」をいう。約束，道徳上の責任とあることから，債務には，法的債務のほか，推定的債務や衡平法上の債務[15]も該当することが窺える。

したがって，負債の範囲は，法的債務だけに限定されないことになるが，3者の負債の認識範囲について相違をみると，日本は法的債務（法律上の義務に準ずるものを含む）のみを負債の認識範囲としている。それに対し，FASBは法的債務に加えて，推定的債務及び衡平法上の債務も認識範囲としており，IASBにおいては，法的債務に加えて，推定的債務までその認識範囲としているため，日本における負債の定義が国際的にみて非常に狭いことがわかる。

ⅱ．資産除去債務の範囲に関する考察

米国のSFAS第143号によれば，資産除去債務会計の認識対象となる負債の範囲は，「長期資産の取得，建設，開発および通常の運転から生ずる長期資産除去に係わる法律的債務（Legal Obligation）である」としている。このようにSFAS第143号は負債の範囲を法的義務のある債務に限定している。しかし，この法的義務には約束的禁反言の原則による約束を含むとしている。[16]

SFAS第143号では，法的債務とは，次のような事象の結果として当事者が決済することを要求される義務である，とされている。

(a) 法律，政令または条例のような政府の決議
(b) 書面契約または口頭契約のような企業間の合意
(c) 約束的禁反言の原則に基づき，約束者の実行を合理的に期待させるために第三者に伝達された約束

(a) は，法令上の義務であり，正に法的債務である。(b) は契約上の義務であり，(a) に準ずる法的債務であると言える。しかし，(c) は約束的禁反言の原則に基づく推定的債務であると考えられ，本来，法的債務に含むべきではない。

負債の定義の中で「発生の可能性の高い将来

の経済的使益の犠牲」と定義されており，「発生の可能性が高い」という要件を満たすのであれば，推定的債務もSFAS第143号における法的債務として認識されるのである。その結果，推定的債務も法的債務として資産除去債務の範囲に含まれることになった。

したがって，有形固定資産の資産除去が法律により義務づけられている場合だけではなく，資産除去の発生可能性が高いと期待される場合においても資産除去債務が生じることになる。ただし，推定的債務の特定は主観的となるため，約束的禁反言の原則に基づく推定的債務を含めた上で，資産除去債務の範囲を法的債務に限定しているのである。言い換えれば，SFAS第143号では，資産除去債務の範囲を法的債務としているが，約束的禁反言の原則によるものも含まれるとしているため，法律上の債務より広い概念を想定していると考えられる。

IASBの資産除去債務の範囲には，法的債務に加えて推定的債務も含まれている。

日本の会計基準における「法律上の義務に準ずるもの」は，債務の履行を免れることがほぼ不可能な義務（すなわち，発生の可能性が高い債務）であり，法律上の義務とほぼ同等の不可避的な義務を指す。企業が負う将来の負担を財務諸表に反映させることが投資情報として有用であるとみなされるのであれば，資産除去債務は法令・契約で要求される法律上の義務だけに限定されないのである。以上のことから，わが国の会計基準の定義は，SFAS第143号の定義とほぼ同じである。

ただし，菊谷氏は「SFAS143が約束的禁反言の原則に基づく約束（推定的債務）も積極的に法的債務として位置付けているのに対し，会計基準における「法律上の義務に準ずるもの」は，法律上の解釈により清算が要求される債務，法律上の義務とほぼ同等の不可避的な債務等に制限されているため，資産除去債務の範囲は若干狭く，厳格に限定されているように思われる。」[17] と米国基準と日本基準との認識範囲について多少の相違があることを指摘している。

以上から，資産除去債務の適用範囲において，日本基準，FASB，IASBとも，法的債務が含まれること及び資産除去債務を法律上の義務に限定しないということは同じであり，3社とも相違はないが，最終的な適用範囲は多少異なるものとなっている。IASBの資産除去債務の範囲には，法的債務に加えて推定的債務も含まれていること，米国における法的債務は，約束的禁反言の原則の法理に基づく推定的債務を含むため，日本の契約法における法的債務は，比較すると概念的に狭いことがわかる。日本，FASBはその範囲を法的債務に限定しているが，FASBは日本よりその認識範囲が広い，また，IASBは法的債務に加えて，推定的債務まで負債の認識範囲としていることから，IASBはFASBや日本と比べて資産除去債務の認識範囲が広いことがわかる。

2. 資産除去債務と負債概念の拡大

ⅰ．債務の拘束性と蓋然性[18]

資産負債の両建処理で処理すると，資産の取得当初から，認識された債務の全額が負債として計上され，かつ，その同額が資産にも計上される。つまり，債務の認識範囲を定めることは，負債だけでなく資産の計上額も定めているといえる。池田教授によれば，この債務の認識範囲に大きな影響を及ぼしているものは，債務の拘束性と蓋然性基準という2つの認識要件であるとして，債務の拘束性と蓋然性について以下のように説明している。[19]

債務の拘束性とは，企業が免れることのできない義務の強さを表すものであり，この拘束性を認識要件として強く求めるに従って，債務の認識範囲は狭くなるという特徴がある。債務の拘束性の観点から比較すると，IAS第37号，SFAS第143号，そして，企業会計基準第18号の順に拘束性が強くなっていることがわかる。そのため，債務の認識範囲は，これらの順に狭くなっている。

次に蓋然性基準とは，一定の蓋然性を有する債務を認識するための要件であり，測定におけ

る信頼性を担保することを目的とするものである。但し，これを認識要件とすることは，債務の早期計上を妨げ，認識の判断に恣意性が介入するといった問題がある。

これらの問題を回避するため，SFAS第143号および企業会計基準第18号において，蓋然性基準は認識要件とされておらず，測定の計算過程に組み込まれている。なお，IAS第37号においては，認識要件としての蓋然性基準が定められている。そのため，発生の可能性が50％に満たない債務はその認識の対象から除外されており，債務の認識範囲が他の会計基準とは大きく異なっている。しかし，第37号の修正案では，債務の拘束性の程度をより厳格にするとともに，蓋然性基準を削除する提案がなされていることから，国際会計基準は，今後，米国の会計基準および我が国の会計基準に近づくことが予想される。

債務の早期計上を促すために，債務の認識要件から蓋然性基準を削除したことは，計上された金額の正確性を低下させることとなった。特に発生の可能性がかなり低い場合には，根拠となるデータも少なく，合理的な見積りを求めることは難しい要求となる。また，蓋然性が測定の計算過程に組み込まれたことで，蓋然性の数値化が必要となった。

一方，資産除去債務の会計基準に限っていえば，負債概念は必ずしも拡大してきたとはいえない。むしろ，一定の歯止めがかかったことがわかる。具体的には，債務を認識するか否かの判断において恣意性が介入することを防ぐために，債務の認識要件として要求される拘束性の程度が，以前よりも強く求められるようになったのである。そのため，債務の認識範囲が縮小することになった。資産除去債務は，比較可能性を維持すべく負債の範囲を縮小する論理を他の項目に先駆けて適用した項目とみなされ，負債拡大に歯止めをかけたといえる。

資産除去債務の認識範囲に大きな影響を及ぼすものは，債務の拘束性および蓋然性基準という2つの認識要件である。ところが，蓋然性が認識要件ではなく測定計算に反映されるようになると，資産除去債務の認識要件は，主に債務の拘束性の程度によって定まることになる。この債務の拘束性の程度は，いずれの会計基準においても，比較可能性の向上および認識範囲の拡大というトレードオフの関係にある2つの目的によって定まっているが，測定にかかわる問題の改善を試みるのであれば，債務の認識要件として要求される債務の拘束性の程度はより強くなると予想される。つまり，SFAS第143号およびIAS第37号が規定する債務の拘束性の程度は，企業会計基準第18号が規定する拘束性の程度へと近づくことになる。

上記のように，資産除去債務の認識範囲は，債務の拘束性と蓋然性基準により委ねられる。しかし，蓋然性基準が削除されたとしても，計算過程において蓋然性の数値化が必要になること，そして債務の拘束性はより強く求められることから，資産除去債務についていえば，負債概念の拡大に一定の歯止めがかかっていると言える。

ⅱ．損益計算と負債の全貌表示

昨今，意思決定有用性の観点から，利害関係者の意思決定に役立つものであれば出来る限り，会計情報に取り込むことが流行になっているが，貸借対照表・損益計算書等の財務諸表によって会計情報を開示するという形式をとっている以上，会計情報というのは，種々に存在する情報の一形態であり，複式簿記から導き出された特殊な情報にすぎない。したがって，その意思決定への役立ちに対しても自ずと限界がある。それにもかかわらず，意思決定への役立ちという目的によって，あらゆる事象を無制限に取り込むならば，会計情報それ自体の有意味性が喪失してしまうことにもなりかねないのである。例えば，損益計算に規定された現行会計に負債の全貌表示という計算目的を持ち込めば，現在事象と将来事象とが混在することになり，会計情報は，統一的な意味付けを喪失してしまうことになる。

そうだとすれば，財務諸表本体は，あくまで，損益計算の論理によって統一的な構成を保持し，どうしても将来事象にかかわる負債の表示が必要とされる場合には，注記・付属明細表において公開すればよいのではないか。仮に負債の全貌表示に関する情報が必要だとしても，財務諸表本体において，すべての負債が計上されなければならないということにはならない。負債の全貌表示という計算目的をとった上で，注記・付属明細表において表示する，ということで問題ないように思える。

損益計算と負債の全貌表示とは，少なくとも有害物質の排出・除去にかかわる事象については，トレードオフの関係にあると思われる。すなわち，少なくとも資産除去債務に関する限り，負債の全貌表示ということは，会計に将来事象を取り込むことを想定せざるを得ないからである。

損益計算というのは，最終的に処分可能利益の算出に繋がるものであるため，現実になされた企業の経済活動に基づいて遂行されなければならない。それゆえ，損益計算（処分可能利益の算出）の計算対象は，現在事象だけのはずである。一方，資産除去債務の計算対象は，将来事象である。このように計算対象の相違がある以上，損益計算と負債の全貌表示とは，ひとつの体系に両立できないということになる。[20)]

ⅲ．修繕引当金及び特別修繕費との比較

基準第18号第25項においても，「資産の使用開始前から予想されている将来の支出であり，資産除去債務と同様に扱わないことには整合性にかけるのではないかとの見方がある。」と指摘している。購入から廃棄に至るまでの支出額を負債計上し，設備の稼働に応じて不可避的に生じる費用項目についても負債計上すべきとする考え方である。

資産除去債務の会計基準によれば，当初取得時点で将来の廃棄処分時点の現金価格相当額を資産除去債務として負債計上される。資産除去費用を将来の債務として負債に計上するのであれば，修繕・管理維持という行為も当該資産の取得の結果として生じる債務であるので，将来における修繕費・管理費も取得時点で認識すべき債務として負債に計上しなければならないという論理が成り立つのではなかろうか。

特別修繕費の会計処理では，将来の修繕については経営者の意図で回避が可能であることに加え，操業停止や対象資産の廃棄をした場合には修繕は不要となり，法律上の義務を履行しなくてもよい場合が出てくるのである。

以上のことを踏まえると，資産除去債務の会計事象とは異なっていることがわかる。つまり，特別修繕費は，資産の取得時において，法律上の義務は存在するが，当該義務の性格は，回数が決まっていない点など資産除去債務の法律上の義務とは異なっている。特別修繕費は，その行為が法律上の義務であると捉えられるものの，その債務の性格は推定的債務に留まるといえる。

それに対し，資産除去債務の会計事象は，資産の取得稼働と同時に当該義務の履行を逃れられないことが大きな特徴であるため，法的債務の括りに入ることになる。資産除去債務会計においては汚染除去という義務を負ったこと自体を負債として認識しているのである。言い換えれば，将来の除去時点の行為は関係なく，有形固定資産の取得時点で義務を負っているか否かを重要とする会計処理であるといえる。

特別修繕費についての認識が行為自体の認識であるため，その将来の行為の不明瞭さから負債計上を行っていないことを明らかにしている。言い換えれば，将来の行為が確定していることが資産除去債務の両建処理における負債計上を導いており，このような限定こそが資産除去債務の負債認識において両建処理を導く根拠となると考える。[21)]

負債計上するか否かは，将来の行為が確定しているかどうかに依存する。そして，負債計上する貸方項目をどのように処理するかによって，借方項目も決まってくる。貸方が引当金であれば，借方は費用となる。また，資産負債の

両建処理が成り立つとすれば，貸方が確定債務として負債計上されるのであるから，借方の除去費用は取得原価に含めるとの論理からであろう。貸方負債計上をどのように処理するかによって，会計処理が導き出されるのである。

Ⅲ．資産除去費用の資産性分析

1．除去費用と付随費用の整合性分析

ⅰ．資産の定義と付随費用

ASBJの「討議資料財務会計の概念フレームワーク」によると，資産とは「過去の取引または事象の結果として，報告主体が支配している経済的資源」と定義されている。「経済的資源」であり，将来のキャッシュの獲得に貢献するものと解される。また，IASB「財務諸表の作成及び表示に関するフレームワーク」における資産とは，「過去事象の結果として特定の企業が支配し，かつ，将来の経済的便益が当該企業に流入すると期待される資源」と定義される。「経済的便益」であり，企業への現金および現金同等物の流入に直接的または間接的に貢献する潜在能力をいい，当該企業への正味キャッシュ・インフローをもたらすものと解される。ASBJ・IASBのどちらの視点をとっても，将来の「経済的資源」・「経済的便益」を獲得する能力があるものが資産として定義できる。

一方，有形固定資産の取得原価は，通常取得に要する対価を表すと考えられている。それゆえ，取得原価は，当該資産の取得に要した対価によって測定される。取得に要した対価とは，通常，有形固定資産そのものの代金である購入代金に，有形固定資産を使用可能な状態にするために必要となる付随費用を加えたものとされている。このように，我が国において有形固定資産の取得原価の構成要素とされる項目は，有形固定資産の使用に際して，実際に支出した項目に限られている。したがって，取得原価に加えられる付随費用も，有形固定資産の取得に関連するコストのうち，既に支出したコストから成り立っている。

ⅱ．資産の定義と除去費用との整合性

IAS第16号は，その変遷において取得原価の概念を変容させ，二度の改訂を通じて，資産除去債務の除去費用を取得原価の付随費用として構成することを可能にした。しかし，そのようにした結果「IASB『財務諸表の作成および表示に関するフレームワーク』の資産の定義である「過去の事象の結果として当該企業が支配し，かつ，将来の経済的便益が当該企業に流入されることが期待される資源」と内部矛盾を抱えることになった」[22] と松本氏は指摘している。

将来の「経済的資源」・「経済的便益」を獲得する能力であるためには，将来のキャッシュ・インフローをもたらすものでなければならないが，除去費用は将来のキャッシュ・アウトフローであるため，資産の定義の範囲内にあるものとは考えにくい。

また，廃棄時点の支出が，将来の「経済的資源」・「経済的便益」を獲得する能力に寄与できるとは言い難く，従来のキャッシュ・インフローと結び付けられていた資産の性質である将来の「経済的便益」が，支出額というキャッシュ・アウトフローから計上されている観点を疑問視する声が多方面から上がったのは当然のことである。

「除去コストが確定しており不可避だからといって，その金額が，なぜ機械の取得原価を構成し得るのであろうか。もちろん，特定の「現金支出」あるいは「将来の現金支出義務」により，当該資産の便益を高めたのであれば，その取得原価に含めることは，理論的にも得心し得る。～中略～当該機械が排出する有害物質の除去に必要なコストが，問題になっているのである。この排出物を除去したからといって，その機械の価値生産にかかわる便益をどのように高めたのであろうか。」[23] と笠井氏は述べており，醍醐氏も「有害物質を排出することによって資産価値が増加するわけではないし，資産の使用可能年限が延長されるわけでもない。このような除去コストに原価性があるかどうか疑問が残る。」[24] と有害物質の除去に係る支出は資産価

値や使用可能年限といった資産の「経済的便益」を高めるものではないと指摘している。それゆえ，将来支出である除去費用は，資産の定義から逸脱しておりその整合性はとれないものと考えられる。

ⅲ．資産負債アプローチと減価償却

減価償却というものは，本来，適正な費用配分を行うことによって，毎期の損益計算を正確ならしめる配分計算である。固定資産取得のために投下され固定化されていた資金が，減価償却の手続きにより再び貨幣性資産として回収され流動化するという回収計算の機能も認められるが，それは副次的なものである。このように考えると，将来の有形固定資産の除去に係る支出が取得原価として減価償却されることは適切ではないということになる。

基準第18号は，「投資について回収すべき額」を取得原価が表すことができるとしており，これによって，有形固定資産の取得原価およびその減価償却に関して，回収計算という観点が重視されているとみることができる。このような考え方に立つのであれば，資産除去に係る支出のみが取得原価に含められ，有形固定資産を維持するための支出が取得原価に含められないとするならば，整合性に欠けるといえるのではないか。投下資本の回収計算を念頭においた考え方かもしれないが，未投下の資本を回収する，ということはそもそも時系列としてあり得ないことである。

除去費用を資産として処理計上するという点から，資産負債アプローチに基づく負債計上を重視した会計処理を求めながら，一方で減価償却による期間損益計算を意識した計算を含んでいるという矛盾点もある。このような指摘から，除去費用は会計基準が定められたという拘束性と取得原価の付随費用と同様と考えるということ以外，説明がつかないまま取得原価に含められ資産計上しているのである。

除去費用は，有形固定資産の使用後の除去時点で発生する費用であり，有形固定資産の使用期間におけるその経済的便益を高めるものではない。将来の除去費用の額を示す負債計上は必要かもしれないが，未支出の費用を減価償却するのは期間損益計算を歪める。したがって，資産除去費用は，そもそも減価償却によって費用配分する必要のない費用であり，発生した時点で認識すべき費用であると考えることもできる。

2. 各国の取得原価概念と取得原価概念の変容

ⅰ．我が国における有形固定資産の取得原価と取得原価主義

企業会計原則では「貸借対照表に記載する資産の価額は，原則として，当該資産の取得価額を基礎として計上しなければならない。資産の取得価額は，資産の種類に応じた費用配分の原則によって，各事業年度に配分しなければならない。（以下省略）」（第三-貸借対照表原則五）と規定されている。

つまり，資産は取得原価で計上すること，そして，資産の取得原価は，費用配分の原則によって各会計期間に費用として配分されるという，取得原価主義の基本的な原則が明確に規定されている。

取得原価主義とは，資本循環において，費用性資産は，取得に要した支出額（取得原価）で評価され，貨幣性資産は時価（回収可能価額）で評価される，とする考え方である。これは収益の実現主義の原則を，資産の評価原則として表現したものである。つまり，収益の実現主義の原則は，分配可能利益を測定するための原則であり，資本の投下過程においては利益を認識せず，資本が貨幣性資産として回収された段階で初めて利益を認識する原則である。従って，取得原価主義の下では，投下資本は貨幣性資産となって回収されるまでは，資産の保有中，時価の変動があっても，取得原価で評価し続ける必要がある。

ⅱ．取得原価概念と除去費用との矛盾点

資産負債の両建処理を採用した場合，有形固定資産の取得時点の現金価格相当額および資産

除去債務が認識された時点の割引現在価値との合計額に基づく減価償却費は，過去支出額と将来支出額との混合による費用であり，当該期間の収益と同期間的・同価値的な対応は確保できず，適正な期間損益計算を担保できているとは言い難い。インフレ補正をした除去時点の将来支出額の割引価値に基づいて償却するのであれば，資産取得時点の過去支出額も当期現在の価値水準に修正した価値（基礎価額）に基づいて減価償却すべきである。

取得時点ばかりではなく廃棄（資産除去）時点に必要となる費用も取得原価に算入することは，当該資産に係る総費用額（総支出額）を減価償却により回収するという会計思考であろうが，資産除去サービスに要する支払額の割引価値を加算した取得原価は，従来の取得原価概念（当該資産取得のために支出した現金価格相当額）と異なる。[25]

それゆえ，菊谷氏は，上述のように取得原価概念および期間損益計算の観点から資産負債の両建処理の矛盾と欠陥を述べた上で「資産除去債務を資産負債の両建処理により会計処理することには，理論的・実践的な欠陥が内在している。法律上の義務等で資産除去が強制されるケース，環境負債のリスクが懸念されるケース等の特殊な場合に限り，資産負債の両建処理が採択されてもよいかもしれないが，一般的な有形固定資産（事業用資産）に対しては，引当金処理が利用されるべきである。」[26] と指摘し，新たな概念が理論的に構築されるべきであるとしている。

ⅲ．国際的な会計基準における有形固定資産の取得原価

国際会計基準において，有形固定資産の取得原価は，資産取得時において，当該資産取得のために支出された現金もしくは現金同等物の価額，またはその他引き渡された対価の公正価値[27] と定義されている。

資産負債の両建処理を行えば，当初認識時点で将来の廃棄処分時点の現金価格相当額も取得原価に含まれる。将来の解体・撤去時における支出を取得時点の取得原価に含めることは，IAS第16号が定義する「当該資産取得のために支出した現金価格相当額」とは異なる取得原価概念であり，内部矛盾を起こしていた。また当該資産廃棄時点の支出が，将来の経済的便益を稼得する能力に寄与できたとは言い難い。資産概念そのものが理論的に変容したと言わざるを得ないため，取得原価の定義の解釈にも変更が読み取れる。

そして，国際会計基準では，取得原価の構成要素として，以下の3項目があげられている。

(a) 値引および割戻控除後の購入価格（輸入関税および還付されない購入税を含む）
(b) 有形固定資産の設置費用，並びに経営者が意図した方法で使用するために必要となる直接付随費用
(c) 有形固定資産の解体および除去コスト，並びに敷地の原状回復費用，取得時に，または特定の期間に棚卸資産を生産する以外の目的で当該有形固定資産を使用した結果生ずる債務の当初見積額

米国基準では，アメリカ財務会計概念書（Statement of Financial Accounting Concepts 以下SFACという）第5号において，「取得原価とは，当該資産を取得するために支払った現金額または現金同等額」とされていることから，米国基準においても，国際会計基準における構成要素（a）および（b）は有形固定資産の取得原価の構成要素に含まれると考えられる。そして国際会計基準における取得原価の構成要素（c）である「有形固定資産の解体および除去コスト等」についても，有形固定資産の構成要素に含めるとされている。[28] したがって，米国基準における有形固定資産の取得原価の構成要素は，国際会計基準と同様の内容をもつと考えられる。[29]

前述したように，現行の我が国における有形固定資産の取得原価は，すでに支出したコスト

に基づいて測定されており，将来支出されるコストは取得原価の構成要素とはされていない。しかし，国際的な会計基準における取得原価は，すでに支出した費用と，除去費用という将来支出される費用の双方を含むと考えられる。

政岡氏は，「資産除去債務の会計にみられる取得原価は，「過去に支出したコスト」および「将来支出されるコスト」から構成されている。これらのコストは，支出時点こそ「過去」または「将来」と異なっているものの，ともに，資産の取得に関連する支出という「取引事実」を表すものである。したがって，「過去と将来のコストの双方を含む取得原価」は，資産の取得に関連する取引事実を表す「原価即事実説に基づく取得原価」ということとなり，我が国における現行の取得原価の枠組みに整合すると考えらえる。」[30] と資産除去債務の会計における取得原価は，支出がほぼ確実に生じること，および支出額が合理的に算定されることを前提していることを条件として，将来発生する除去費用を既に発生している過去の支出額と同等に扱っても差し支えないとの考えを示している。

ここから，有形固定資産の取得原価に対する考え方が，資産除去債務の会計に関連して，取得に関連して過去に支出した費用から，取得に関連して過去に支出した費用，および将来支出される費用の合計へと変わってきていることがわかる。しかし，このことは取得原価と資産除去債務の会計基準との整合性を保つための措置を施した結果，生み出されたものと考える。

ⅳ．取得原価主義と公正価値

公正価値とは「測定日時点で，市場参加者間の秩序ある取引において，資産を売却するために受け取るであろう価格または負債を移転するために支払うであろう価格」（IFRS　par.9）と定義された。

また，SFAS第143号においては測定について，「公正価値の合理的な見積りがされるならば，企業は資産除去債務の負債の公正価値を，それが発生した期間に財務諸表上に計上しなければならない。」とされている（SFASNo.143, para.3）。資産除去債務の測定は合理的な見積りにより測定されるとされているが，合理的な見積りとは，公正価値により測定することである。この場合の公正価値とは，自発的意思をもった当事者間で行われる現在の取引であり，負債の弁済をなすことができる金額である。活発な市場における相場価格は公正価値の最善の証拠であり，入手可能であるなら，測定の基礎として使用されるものである。

一方，基準第18号における測定については，「資産除去債務はそれが発生したときに，有形固定資産の除去に要する割引前の将来キャッシュ・フローを見積り，割引後の金額（割引価値）で算定する。」とされている（基準第18号，第6項）。すなわち，割引現在価値で算定することを意味するが，資産除去債務の算定における割引前将来キャッシュ・フローについては，市場の評価を反映した金額によるという考え方と，自己の支出見積りによるという考え方がある。日本の会計基準では，将来における自己の支出見積りが資産除去債務の測定値の基礎として適当であると判断される場合，自己の支出見積りによる将来キャッシュ・フローの算定も公正価値の合理的な見積りとして扱われている。

IFRSの公正価値の概念は，取得原価主義と整合する部分も少なくはない。しかし，市場に基礎づけられない公正価値で非貨幣性資産を評価し利益計算する場合においては，IFRSの公正価値概念は取得原価主義と整合性がとれないと考えられる。

つまり，取得原価主義とは，収益の実現主義原則を成立されるための資産評価である。運転資本が市場取引によって回収・換金可能な状態になって初めて収益の計上が認められるのである。これは，分配可能利益の算定を目的としてきた伝統的会計基準の基本原理である。IFRSの公正価値概念は市場を基礎とする概念であるが，市場のない場合においても一定の評価技法を用いて市場価値を見積もることが出来るという前提で組み立てられている。従って，

現実の市場社会において特に非貨幣性資産の場合，市場取引は不完全であり，IFRSの公正価値が市場価値の基礎づけがなされない場合が存在する。その時，IFRSの公正価値概念はその前提を失うことになる。つまり，その時，実現主義原則ひいては取得原価主義と，IFRSの公正価値概念は乖離する結果となる。[31)]

3. リース会計基準との比較

ⅰ．リース会計基準の会計処理

我が国におけるリース会計基準は，企業会計基準第13号において公表されている。当基準第10項において，借手の会計処理として「借手は，リース取引開始日に，通常の売買取引に係る方法に準じた会計処理によりリース物件とこれに係る債務をリース資産及びリース債務として計上する。」とされている。ファイナンス・リース取引は，リース取引の借手によるリース物件の割賦購入又は借入資金によるリース物件の購入取引とみることができ，その経済的実態が売買取引と考えられるため，売買取引に係る方法に準じて会計処理を行うのである。この処理方法は，資産除去債務と同様に資産負債の両建処理である。

リース債務の負債性としては，リース債務はファイナンス・リース取引が中途解約が不能（ノンキャンセラブル）であり，借手は実質的にリース債務の支払義務を負うことになるため，負債性は認められる。リース債務のうち未支出の部分についても中途解約不能であるがゆえ，確定債務として負債計上されるのである。資産除去債務の場合も，その債務の認識範囲は，法令または契約で要求される法律上の義務およびそれに準ずるものに限定されるため，負債性については両者とも同等であると解釈でき，負債計上されることに問題はない。

リース資産の資産性としては，ファイナンス・リース取引により借手が使用収益することとなるリース資産は，借手が支配している経済的資源であることから，その資産性が認められる。つまり，リース資産の所有権は直ちに借手に移転はしないが，借手はリース物件の使用に伴って生じるコストを実質的に負担することとなる（フルペイアウト）。そのため，リース資産の使用によってもたらされるキャッシュ・フロー獲得能力（経済的資源）は，専ら借手に帰属することとなり，経済的利益を実質的に享受することができるから資産性を有するものと考えられる。

ⅱ．リース資産と除去費用との相違

IASBにおける資産の定義は，「過去事象の結果として特定の企業が支配し，かつ，将来の経済的便益が当該既往に流入すると期待される資源」であった。ファイナンス・リース取引の場合，企業は所有権こそ持たないが，契約が中途解約不能であり，経済的実態が売買取引である。そのため，当該資産を企業が支配し，それから生み出される経済的便益を享受することができるため，リース資産はIASBの資産の定義も充足するものといえる。

一方，資産除去債務における除去費用は，当該有形固定資産を所有しているのであるから，その資産を除去するための「法律上の義務である」費用も企業が支配しているものといえる。しかし，これまでみてきてように，除去費用は将来の経済的便益にはならない。それは，除去費用の具体的内容が，有害物質の除去や原状回復のための解体費用であり，有害物質の除去に係る支出は，資産価値や使用可能年限といった資産の経済的便益を高めるものではないからである。それゆえ，除去費用は資産の定義に該当せず，資産性は否定された。

資産除去債務の会計処理においては，未支出の除去費用を減価償却することによって，適正な期間損益計算が担保されないといった問題が発生する。

リース資産の減価償却方法は，その契約内容により，自己所有の固定資産と同一の方法により行う場合と償却期間をリース期間とし残存価額はゼロとして行う方法の二つがある。リース

図表 3-1　リース資産と資産除去費用の相違

	リース契約	資産除去費用
資産の支配	あり	あり
経済的便益	あり	なし
債務の支払	契約に従い支出	未支出
減価償却による期間損益計算	適正	不適正
契約の実行	履行される	双務未履行

（出所）筆者作成

契約を締結した時点では，全額未払いの状態であり負債計上されるが，通常リース料は毎月支払うため，負債額は契約期間が経過するに従って減少していく。そのため，所有権移転外ファイナンス・リース取引は，リース期間で減価償却する方法をとるため，支出と償却が期間的に合致し，未支出のものを償却するという事態にはならない。すなわち，減価償却費は，過去支出額と将来支出額との混合費用とはならず，適正な期間損益計算を担保できる。また，所有権移転ファイナンス・リース取引には，自己所有の固定資産と同一の方法で減価償却を行うが，リース期間と耐用年数が大きく乖離することは想定しにくいため，支出と償却の期間的・金額的なずれはあったとしても，許容の範囲内であり，期間損益計算を歪めるものではない。

さらに，リース契約はリース物件の納入という契約は実行されるが，資産除去債務は，除去時点まで契約は双務未履行である点も大きな相違である。

リース契約と資産除去債務の会計基準を比較した場合，当初認識時こそ，双方とも全額未払いの状態であり，会計処理もこれを資産及び負債に同時に計上するという点において同様である。しかし，リース契約の場合には，契約締結以降，契約は実行され，支払は契約に従い多くの場合計画的に行われていくが，資産除去債務の場合には，契約は未履行であり，債務の支払は資産の除去時点まで未支出なのである。

Ⅳ．資産負債の両建処理以外の会計処理の検討

1．基準第18号で検討された会計処理

ASBJは，基準第18号の中で，資産除去債務の会計処理方法として，除去費用を残存価額から控除する方法，引当金処理及び長期前払費用として計上する方法（以下「長期前払費用処理」という）を採用しなかった理由を掲げている。

ⅰ．残存価額控除法の検証

資産除去費用を残存価額から差し引き，要償却額に加算する会計処理法を「残存価額控除法」と呼ばれているが，この方法については，基準第31項において言及されている。

要償却額＝取得原価－（残存価額－資産除去費用）

「連続意見書　第三」によれば，「残存価額とは，固定資産の耐用年数到来時において予想される当該資産の売却価格または利用価格であり，解体・撤去・処分等のために費用を要するときには，これを売却価格または利用価格から控除した額をもって残存価額としなければならない。」とされており，残存価額控除法は，この連続意見書の残存価額の定義に基づいた処理方法である。

解体・撤去・処分等のための資産除去費用は，「負の残存価額」とみなされている。当初

の残存価額から資産除去費用を控除するということは，当該資産の当初における減価償却費に資産除去費用を加算した金額をもって要償却額とし，減価償却を行うことになる。当該資産の要償却額は，資産除去費用が減価償却費の追加費用として取り扱われる。

この残存価額控除法では，有形固定資産の取得および除去の費用（設置・除去費用）は，当該資産にとって必要な総費用として回収されている。有形固定資産の取得取引と資産除去サービスを一体のものとして捉えている。つまり，当該資産を取得した結果，資産除去サービスを受けるのであり，資産除去取引は資産取得取引と一体のものとみなされ，回収されるコストの中に資産除去費用も算入される。当該資産取得のために支出した現金価額相当額ばかりでなく，資産除去のために支出した現金価格相当額も減価償却を通じて回収される。このような残存価額控除法によれば，資産除去費用は減価償却費の中に混入・計上され，当該資産に係る総費用の回収計算の構成要因となることができる。

ただし，連続意見書第三において「有形固定資産の減価償却はこれまで取得原価の範囲内で行われてきたこともあり，残存価額がマイナス（負の値）になるような処理は想定されず，適用されてきてはいなかった」とある。しかし，減価償却費は資産除去費用の期間配分相当額だけ増加するが，当該資産の帳簿価額は利用期間の途中（耐用年数到来前）でマイナスになる可能性もある。すなわち，貸借対照表上の資産価額の合理性は考えていないといえる。[32)]

このような会計処理上の重大な欠点を抱えているため，この会計処理方法の採用の可能性は非常に低いといえる。

ⅱ．引当金処理の検証

基準第33項において，「引当金処理に関しては，有形固定資産に対応する除去費用が，当該有形固定資産の使用に応じて各期に適切な形で費用配分されるという点では，資産負債の両建処理と同様であり，また，資産負債の両建処理の場合に計上される借方項目が資産としての性格を有しているのかどうかという指摘も考慮すると，引当金処理を採用した上で，資産除去債務の金額等を注記情報として開示することが適切ではないかという意見もある。」と引当金処理について言及しているが，基準第34項において，「引当金処理の場合には，有形固定資産の除去に必要な金額が貸借対照表に計上されないことから，資産除去債務の負債計上が不十分である」との理由により引当金処理は採用していない。さらに，単なる注記における情報開示などでは，資金面での準備が全くなされないことにもなりかねない。将来発生する除去費用のために資金留保をしておくことは必要であるため，それに繋がる会計処理を選択することも重要である。

前述したように債務の認識要件は，主に債務の拘束性の程度によって定まる。資産除去債務の会計基準に限っていえば，その認識範囲が法令又は契約で要求される法律上の義務及びそれに準ずるものに限定されているため，債務の拘束性は高いものである。国際的な動向を踏まえ資産負債アプローチの観点に立てば，拘束性の高い債務の負債性を重視し，負債計上することの優位性を選択するのは当然のことといえる。ASBJは，現在の世界的なコンバージェンスの流れを汲みとり，資産負債アプローチを重要視したことからの判断といえる。

ⅲ．長期前払費用処理の検証

基準第42項においては，「資産除去債務に対応する除去費用を，当該資産除去債務の負債計上額と同額の資産として計上する方法として，当該除去費用の資産計上額が有形固定資産の稼働にとって必要な除去サービスの享受等に関する何らかの権利に相当するという考え方や，将来提供される除去サービスの前払い（長期前払費用）としての性格を有するという考え方から，資産除去債務に関連する有形固定資産とは区別して把握し，別の資産として計上する方法

も考えられた。」と貸借対照表において資産除去債務に対応する借方項目を長期前払費用として計上することも検討したことを明らかにしている。

しかし，同項の中で続けて，「当該除去費用は，法律上の権利ではなく財産的価値もないこと，また，独立して収益獲得に貢献するものではないことから，本会計基準では，別の資産として計上する方法は採用していない。当該除去費用は，有形固定資産の稼働にとって不可欠なものであるため，有形固定資産の取得に関する付随費用と同様に処理することとした。」と長期前払費用として個別表示することを選択しなかった理由を記している。

前払費用とは，経過勘定の1つで，一定の契約に従い継続して役務の提供を受ける際，未だ提供されていない役務に対して支払われた対価のことである。前払費用は，時間の経過とともに時期以降の費用となるものであるから，貸借対照表には経過的に資産として計上される。

資産除去債務の除去費用は，(1) 除去サービスについての契約が締結されているとは限らない。(2) 除去サービスは，継続した役務の提供を前提としたものではない。(3) 除去サービスは，対価も確定しておらず，未支払いである。未だ提供されていない役務に対するものという点についてのみ前払費用と除去費用は共通するが，以上の理由から，除去費用は，前払費用の要件を満たさないため，長期前払費用として資産計上することは難しいと言わざるを得ない。

基準第18号の中では触れられていないが，それでは，資産除去債務の除去費用を長期前払費用ではなく，繰延資産として計上する方法はどうであろうか。繰延資産は，「将来の期間に影響する特定の費用」として，「すでに対価の支払が完了し又は支払義務が確定し，これに対する役務の提供を受けたにもかかわらず，その効果が将来にわたって発現するものと期待される費用」[33] のことである。

資産除去債務の除去費用は，(1) 対価の支払が完了し又は支払義務が確定していないこと，(2) 役務の提供は未だ受けていないこと，(3) 効果の発現は不明確である。

財産性の観点からみると，長期前払費用は，未だ役務の提供を受けていない部分に対応する資産であるので，財産性を有するが，繰延資産は，すでに役務の提供を受けているため，財産性を有しないものである。財産性を有しないという点についてのみ，繰延資産と除去費用は共通するが，上記の理由から，繰延資産の定義にも該当しないことから，除去費用を繰延資産として資産計上することは難しい。

2. 会計処理に関する先行研究の検証と提案

ⅰ. 引当金資本説の検証

内川菊義氏は，資産負債の両建処理の方法は，正確な利益を算出しうる適正な会計処理の方法ではない，として資産除去債務は引当金資本説によるべきと論じている。引当金資本説とは，資産除去債務は，企業会計上の負債ではなく，引当金であるとし，そして引当金は負債ではなく資本の一項目であるとするものである。この（貸方）引当金に対応する（借方）の引当金繰入額は，資産の評価勘定でもなければ，費用（損失）勘定でもない。それは，売上収益からの控除を示す勘定科目である，という思考である。

内川氏によれば，「企業会計上負債性引当金というものは存在しない。つまり，その負債的性格が認められるものは，引当金ではなく未払費用あるいは未払金等の項目であり，また逆に，その引当金として認められる項目は，負債的性格をもたず，むしろ資本としての性格をもつものである。」[34] として引当金は負債には該当せず，資本の一項目であると述べている。

また，双務未履行の状態である資産除去債務について，以下のように言及している。「資産除去用役の提供とその対価の支払債務のうち，前者の資産除去用役の提供という取引事象の存在を全く無視して，後者の支払債務のみを取り上げ，それを固定資産の取得時に負債として計

上するとともに，しかも，同額をそれが固定資産の耐用年数終了時に受け取るはずの資産除去用役を，あたかも固定資産の取得時に受け取った用役であるかのように取扱い，これを固定資産の取得原価に加える。」[35] そのため，双務未履行の取引をオンバランスにする資産負債の両建処理の方法は，収益力のある資産および負債のなかに，収益力のない資産および負債を混在させるものであり，その結果，そこから算出される利益は正確なものとはなりえない，とも指摘している。

基準第34項において，「引当金処理の場合には，有形固定資産の除去に必要な金額が貸借対照表に計上されないことから，資産除去債務の負債計上が不十分であるという意見がある」と引当金処理によった場合には，会計情報として不十分であると述べられていることに対して，この資産除去債務を負債として，その全額を貸借対照表に計上するという事項は，それに対応する資産除去債務の資産計上による利益算出過程を不正確にするという事実を無視してまで，それを貸借対照表に計上しなければならないほど重要な情報内容ではない[36] と述べ，単に注記で済む事項であるように思われると締め括っている。

内川氏は，この論文の中において，どれほどの収益を獲得したのか，収益量が重要であると述べており，収益費用アプローチを支持する考えを示している。適用指針の資産負債の両建処理の方法は，資産負債アプローチに基づいており，収益量を問題としていないのは重大な欠陥である，と指摘している。

収益費用アプローチの観点に立ち，収益量が重要であるとしても，何故（貸方）資産除去債務に対する（借方）が売上収益の控除項目となるのか。内川氏は，資産除去債務は，負債ではなく引当金であるとし，また引当金は負債ではなく資本の一項目であるとの論拠から，引当金繰入額は，資産の評価勘定でもなければ，費用勘定でもないとして，消去法的に売上収益からの控除項目にしているに過ぎない。むしろ重要である収益量を不正確なものとする結果になるのではないか，疑問が残る。

ただし，（貸方）資産除去債務をどのように位置付けるのか，つまり，負債と捉えるのか，引当金とするのか，もしくは資本の一項目とするのかによって，借方科目の処理・位置づけも決まってくるという内川氏の論理展開は，借方をどのように捉えて処理すべきか考えるにあたって，ヒントを与えてくれている。

ⅱ．包括利益処理法の検証

包括利益処理法とは，有形固定資産の取得時に資産除去債務を計上し，それに対応する資産除去費用を資産除去債務相当額としてその他の包括利益に計上する方法である。その後，資産除去時に資産除去債務相当額をその他の包括利益から資産除去費用として純損益項目に振り替える（リサイクルする）会計処理である。[37] 立正大学の榊原英夫氏が，現行の会計基準による資産負債の両建処理の問題点を明らかにした上で，その他の包括利益を使用した資産除去債務の会計処理として提案している。

榊原氏によれば，資産除去費用は，有形固定資産を将来除去する時点で発生する費用であり，有形固定資産の取得時において，資産除去費用を認識することは不合理であるとし，資産除去費用を純損益計算から除外することは，純損益計算書の目的適合性を高めることになる，との論理に基づき資産除去費用は，資産除去債務相当額としてその他の包括利益に計上するというものである。

資産除去費用は，有形固定資産の使用後の除去時点で発生する費用であり，有形固定資産の使用期間におけるその経済的便益とは何の関係もない費用であると榊原氏は述べており，したがって，有形固定資産の取得時に計上された資産除去債務相当額（その他の包括利益）は，資産除去費用を純損益計算に含めることがその目的適合性を高める期間に，すなわち，資産除去費用の発生時に，純損益計算書に振り替えられリサイクルされるとしている。

不可避的な資産除去債務を負債として計上することは，企業の財政状態の実態開示の観点から，貸借対照表の有用性を高めるものである。ただし問題となるのは，（貸方）資産除去債務に対応する（借方）資産除去費用の会計処理である。有形固定資産の取得時に将来発生する資産除去債務は負債として計上しておき，それに対応する資産除去債務相当額はその他の包括利益で計上する。資産除去債務を履行するため，財または役務が消費される時点，つまり資産除去費用が発生する時点で資産除去債務相当額をその他の包括利益から資産除去費用として純損益項目に振り替えるべき，とする会計処理である。

榊原氏は，毎期費用化するかどうかに対しては，資産除去債務相当額を有形固定資産の耐用年数にわたり，その他の包括利益から資産除去費用（純損益項目）に振り替える会計処理も考えられるが，そのような会計処理は利益平準化といった政策的な論拠に基づかない限り正当化できない，と述べている。

包括利益処理法によれば，上記に掲げた資産負債の両建処理の問題点を解決することができる。資産負債の両建処理の最も重要な問題点は，（貸方）資産除去債務に対応する（借方）資産除去費用が付随費用として，資産計上されることにある。そして，減価償却することによって有形固定資産の耐用年数の各期に費用配分されることになるが，その減価償却額は，過去に支出した費用と将来支出する予定の費用の混合された金額となるのである。

資産除去債務相当額を純資産の部において，その他の包括利益として処理することについてはどうか。貸借対照表において，まず，資産の部と負債の部に記載すべき事項を積極的に定義して，該当しない項目を純資産の部に記載する。資産・負債の定義に合致しない項目を抽象概念として，その他の包括利益として純資産の部に計上することは，現在の会計思考に基づくものである。その理由は，負債の部に記載すべき項目を積極的に定義することにより，報告主体の支払能力や将来予見される損失を適切に示すことができ，財政状態をより適切に表示することが可能となるためである。

例えば，評価・換算差額等が純資産の部に記載される理由も，資産性又は負債性を有するものではないためである。そして，株主資本以外の項目とされる理由も，評価・換算差額等は，払込資本ではなく，かつ，未だ当期純利益に含められていないものだからである。そのように考えれば，包括利益処理法における資産除去債務相当額をその他の包括利益として，純資産の部に記載することは，既にその他の包括利益として計上している他の項目との整合性もとれると言える。

ⅲ．仮勘定処理説の提案と検討

将来支出する費用も含めた取得原価を減価償却によって費用配分することが，適正な期間損益計算を歪める結果を招く，という点に着目した場合，建設仮勘定のような減価償却をしない勘定科目で処理することも考えられる。つまり，資産の部に当該資産とは別に資産除去債務に対する除去費用を例えば「資産除去費用仮勘定」という名称で別建て処理をしておくのである。

建設仮勘定は，建設中の建物等の手付金や中間金などすでに支払った金額を計上する勘定科目であり，建物が建設途中であることを示すものである。その後，建物が完成した時点で建物に振り替えられる。建設仮勘定が減価償却しないのは，建物が未完成なため，まだ使用されていないからである。

基準第32項において「有形固定資産の除去などの将来に履行される用役について，その支払いも将来において履行される場合，当該債務は通常，双務未履行であることから，認識されることはない。」とある。本来，認識されるはずはない双務未履行の取引をオンバランスさせるのであるから，仮勘定項目として計上することは妥当な処理であると考える。

資産除去債務の対象である資産が使用中で

あったとしても，資産除去債務に対する除去費用が将来支出されるものであることを理由に減価償却の対象から外す，という理論は成り立たないだろうか。この方法によれば，未支出であるものを費用化することによって起きる期間損益の不適正化は，防ぐことができる。ただし，取得原価の定義に基づき既に支出したコストを，資産計上している他の資産との整合性はとれない。国際的な会計基準における取得原価概念が，過去に支出したコストと将来支出されるコストの合計へと変わってきていることを鑑みれば，検討の余地はあるのではないか。

引当金処理は，資産除去債務の負債計上が不十分であることにより採用されなかったが，この処理によれば，両建処理であるため負債計上はなされる。また，除去費用は，法律上の権利ではなく財産的価値もないこと，また，独立して収益獲得に貢献するものではないとの理由から，長期前払費用説は採用されなかった。しかし，仮勘定項目であれば，将来の「経済的資源」・「経済的便益」を獲得する能力を有するものが資産であるとする資産の定義を満たしていないとしても，除去が行われるまでの備忘としての性格として，個別に資産計上するという理屈は成り立たないであろうか。

除去費用は「将来の経済的資源を獲得する能力があるもの」とまでは言えないが，将来役務を受けられる権利が存在することを明示するものである。基準第42項においても除去費用の性格として「有形固定資産の稼働にとって必要な除去サービスの享受等に関する何らかの権利に相当するという考え方や，将来提供される除去サービスの前払いとしての性格を有するという考え方」があると示し，資産除去債務に関連する有形固定資産とは区別して把握し，別の資産として計上する方法も検討している。将来の

図表 4-1　各会計処理の特徴

会計処理	利益観	将来の除去費用の認識	費用配分	資産除去費用としての認識
資産負債両建処理	資産負債アプローチ	○	○	△※1
残存価額控除法	収益費用アプローチ	×※2	○	×※3
引当金処理	収益費用アプローチ	×※4	○	○
長期前払費用処理	資産負債アプローチ	○	△※5	△※5
引当金資本説	収益費用アプローチ	○	○	×※6
包括利益処理法	両者に対応	○	△※7	○
仮勘定処理説	資産負債アプローチ	○	×※8	○

（出所）筆者作成
※1：減価償却費として計上される
※2：残存価額から控除される
※3：減価償却費として計上される
※4：全額の負債計上はされない
※5：独立した資産性がないためそもそも資産として認識できない
※6：売上金額の減額となる
※7：リサイクルの可否が問題となるが、政策的な利益平準化は不要との意見がある
※8：費用化は除去時

支出は債務であり負債計上されるが，その支出に対して役務を当然に受けられる権利は存在するのである。資産の取得と除去は独立した別個の取引であるとの意見もあるように，その認識方法を金融商品会計基準で採用されている財務構成要素アプローチ[38]と同じように考え，その権利を減価償却しない仮勘定項目として個別に資産計上してはどうかとの提案である。

ただし，費用化及び費用配分に関しては，除去費用を除去発生時に一括費用処理する場合と同様に除去時に計上することとなる。

おわりに

資産除去債務の会計基準（基準第18号）の成立により，資産除去債務の会計処理として，資産負債の両建処理が採られるようになった。当基準第34項のなかで，引当金処理の場合には，有形固定資産の除去に必要な金額が貸借対照表に計上されないことから，資産除去債務の負債計上が不十分であると指摘している。他方，資産負債の両建処理によれば，有形固定資産の取得等に付随して不可避的に生じる除去サービスの債務を負債として計上できるとともに，対応する除去費用をその取得原価に含めることで，減価償却を通じて，当該有形固定資産の使用に応じて各期に費用配分されるため，資産負債の両建処理は引当金処理を包摂するものとしている。

引当金処理では負債計上が不十分であるとして，引当金処理の欠缺を補完し，すなわち負債計上した上で，期間損益の観点から費用配分も行える方法が資産負債の両建処理である。資産負債アプローチの観点から生み出されたものであるが，収益費用アプローチの観点からも充足できる処理方法である。資産負債の両建処理は，このような経緯で登場した特殊な処理方法であるため，筆者は当初画期的な会計処理方法であるとの印象を受けた。しかし，この処理方法にも種々の問題が存在し，各種の議論を呼ぶ結果となった。資産負債アプローチ・収益費用アプローチの双方の立場も充足させようとした結果，論理上の無理があったのではないかと考えざるを得ない。

資産負債の両建処理の最大の特徴は，将来の除去費用を有形固定資産の取得原価に加えて資産計上する点である。将来の経済的便益を獲得する能力があるもの，という資産の定義からみて，将来キャッシュ・アウトフローである除去費用が資産の要件を満たしているかどうかが問題となる。将来発生する除去費用を資産として計上しても良いのかという問題である。そして，資産に計上された結果，減価償却により各期に費用配分されることになるが，その償却費は，過去の支出額と将来の支出額との混合による費用となり，当該期間の収益と同期間的・同価値的な対応は確保できず，適正な期間損益計算を担保できているとは言い難いものである。将来の除去費用の額を示す負債計上は必要であるが，未支出の費用を減価償却するのは期間損益計算を歪める結果となる。分配可能利益の算定においても，適正な金額を示しているとはいえない。さらに，資産除去費用が付随費用に含まれてしまうと，資産除去費用の発生という事実が会計上認識されないことになる。資産除去費用として損益計算書に計上されないのである。

資産負債の両建処理には，以上のような問題が存在するため，本稿では，これらの問題を明らかにした上で，資産負債の両建処理に代替する会計処理方法が存在しないか検討を行った。先行研究の検証と新たな会計処理の提案も行った。資去費用は「将来の経済的便益を獲得できる能力を有するもの」とまではいえないが，資産除去債務という将来の支出に対して，当然に役務を受けられる権利は存在する。その認識できる権利を有形固定資産とは別に減価償却を行わない仮勘定項目として資産計上するというのが新たな提案であった。この方法によれば，未支出の費用を減価償却することは期間損益計算を歪める，との批判は受けない。検討の余地はあるように思える。

しかし，現段階では，包括利益処理法が上記の資産負債の両建処理における問題点を解決するうえで，有効であると考える。

不可避的な資産除去債務を負債として計上することは，企業の財政状態の実態開示の観点から，貸借対照表の有用性を高めるものであるため必要である。また，負債として計上されることで，企業は資金面の準備も行っていくことになる。それゆえ，基準第33項において，引当金処理を行ったうえで資産除去債務の金額等は注記として表示するとの意見も紹介されているが，単なる注記では不十分である。負債計上を行う点においては，仮勘定処理説も包括利益処理法も同様である。

包括利益処理法は，負債計上された資産除去債務に対応する除去費用をその他の包括利益として純資産の部に計上する。資産の定義に合致しない除去費用をその他の包括利益とすることによって，資産計上することによって生じる問題は解消できる。貸借対照表において，まず，資産の部と負債の部に記載すべき事項を積極的に定義して，該当しない項目を純資産の部に記載する。資産・負債の定義に合致しない項目を抽象概念として，その他の包括利益として純資産の部に計上することは，現在の会計思考に基づくものである。この資産負債アプローチの観点にたてば，包括利益処理法の方が論理的矛盾は少ない。

そして，どの時点で費用化するかに関しては，除去費用は有形固定資産の使用後の除去時点で発生する費用であり，有形固定資産の使用期間における経済的便益とは何の関係もない費用であると考えられるため，除去費用の発生時にリサイクルされ純損益計算に振り替える，と考えるのが会計理論的に一貫したものとなる。有形固定資産の耐用年数にわたり除去費用を損益計算に振り替える会計処理も可能であるが，それは利益の平準化を目的とした処理であると考える。

しかし，実務上，除去費用の発生時に損益計算に振り替えられ，全額費用化される方法は，期間損益計算の観点から弊害があるとの批判も受けるであろう。これに関しては，さらに研究すべき課題である。

注

1）松本　徹〔2008〕『非金融負債会計の研究』専修大学出版局　第1版　pp. 44–47
2）松本　徹　前掲書，pp. 47–49
3）黒川行治〔2009〕「資産除去債務を巡る会計上の論点」『企業会計』p. 28
4）黒川行治　前掲論文，p. 28
5）佐藤信彦〔2007〕「資産除去債務の会計を巡る諸問題」『企業会計』第59巻　p. 1259
6）松本敏史〔2006〕「二つの会計観とキャッシュフロー」『會計』第169巻　p. 48
7）松本敏史〔2007〕「引当金会計モデルの類型と会計基準」『財務会計研究』p. 61
8）小嶋成司，田中　弘〔2015〕「資産除去債務に関する一考察」神奈川大学『商経論叢』p. 99
9）約束的禁反言の原則とは，債務を負担する者が，その相手方が約束に依存することを合理的に予測すべき場合で，かつ，実際に相手方が約束に違反し損害を受けた場合には，不公平が生じないよう，対価なしに行った約束であっても，その履行が強制されうる原則をいう．
10）藤井良広〔2008〕『環境債務の実務』中央経済社　第1版　p. 33
11）基準第50項では，プロスペクティブ・アプローチのほか，キャッチアップ・アプローチ（資産除去債務に係る負債及び有形固定資産の残高の調整を行い，その調整の効果を一時の損益とする方法）及びレトロスペクティブ・アプローチ（資産除去債務の係る負債及び有形固定資産の残高を過年度に遡及して修正する方法）も検討されたが，国際的な会計基準において，将来に向かって修正する方法が採用されていることに加え，我が国の現行の会計慣行においても，耐用年数の変更については影響額を変更後の残存耐用年数で処理する方法が一般的であることからプロスペクティブ・アプローチによる処理を採用している．
　しかし，プロスペクティブ・アプローチに

よれば，有形固定資産の償却期間満了の直前において莫大な除去費用の必要性が判明するような場合には，実質的にほとんど用役潜在力を有していないにも関わらず，多額の追加的負債と同額の資産計上が必要となる．この場合には，実際の用役潜在力とかけ離れた資産評価額を計上することとなる可能性もある．

12）「国際会計基準」『税務経理』 時事通信社 pp. 5-6
13）法的債務（legal obligation）とは，法令，規制，あるいは契約に基づく義務である．
14）推定的債務（constructive obligation）とは，企業が自ら方針や声明を公表して特定の責任を受け入れることを表明し，結果として，その責任を遂行するであろうという期待を社会が抱くことから生じる債務である．
15）衡平法上の債務（equitable obligation）は，倫理・道徳上の制約，つまり，良心や正義感から正しいと信じる行為を第3者に行う義務感から生じる．以上のことから，それぞれの負債の範囲の大小についてまとめると「法的債務」が最も狭義の負債となり，「推定的債務」，「衡平法上の債務」の順に負債の範囲が広がり広義の負債となる．
16）加藤盛弘〔2006〕『負債拡大の現代会計』森山書店　初版　p. 9
17）菊谷正人〔2008a〕「「資産除去債務に関する会計基準」の問題点」『経営志林』p. 44
18）蓋然性とは，ある事柄が起こる確実性や，ある事柄が真実として認められる確実性の度合いを指す．よって高い・低いなどでその度合いを示す．
19）池田　陽〔2012〕「資産除去債務に関する一考察」龍谷ビジネスレビュー　p. 165-166
20）笠井昭次〔2013〕「資産負債観の説明能力：資産除去債務（2）」慶應義塾大学出版会 pp. 18-19
21）生島和樹〔2014〕「資産除去債務の認識についての検討」横浜国際社会科学研究　pp. 40-43
22）松本　徹　前掲書，p. 91
23）笠井昭次〔2012〕「資産負債観の説明能力：資産除去債務（1）」慶応義塾大学出版会　p. 22
24）醍醐聰〔2008〕『会計学講義』東京大学出版會　p. 242
25）菊谷正人〔2007〕「有形固定資産の取得原価と資産除去債務」『税経通信』p. 38
26）菊谷正人　前掲論文〔2007〕p. 39
27）公正価値とは，「測定日時点で，市場参加者間の秩序ある取引において，資産を売却するために受け取るであろう価格，または，負債を移転するために支払うであろう価格（IFRS　par.9）」と定義されており，重要なのは，独立当事者間との公正な市場取引で成立した価格による金額であり，取得原価も時価も包摂する広い概念である．
28）FASB，SFAS　No. 143，par. 11
29）政岡孝宏〔2008〕「資産除去債務の会計にみられる取得原価概念の変容」『企業会計』Vol. 60　pp. 143
30）政岡孝宏　前掲論文，p. 144
31）三宅雅之〔2015〕「取得原価主義から見たIFRSの「公正価値」」慶應商学論集　p. 39
32）菊谷正人〔2008b〕「資産除去費用の会計処理に関する比較分析」『財務会計研究』pp. 6-9
33）「企業会計原則　注解」注15
34）内川菊義〔2014〕「資産除去債務に関する一考察」『會計』p. 627
35）内川菊義　前掲論文，p. 631
36）内川菊義　前掲論文，p. 639
37）榊原英夫〔2016〕「資産除去債務の会計処理に関する提案」『会計監査ジャーナル』p. 91
38）金融資産の譲渡に係る支配の移転を認識する方法として，リスク・経済価値アプローチと財務構成要素アプローチが存在し，金融商品会計基準では財務構成要素アプローチを採用している．リスク・経済アプローチは，金融資産のリスクと経済価値のほとんどすべてが他に移転して場合に当該金融資産の消滅を認識する方法である．財務構成要素アプローチは，金融資産を構成する財務的要素に対する支配が他に移転した場合に，当該移転した財務構成要素の消滅を認識し，留保される財務構成要素の存続を認識する方法である．

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Productivity Change and Restructuring of Vietnamese Banking System: An Empirical Study using Malmquist Indices Analysis

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Abstract

This study aims to examine the performances of Vietnamese banks. Especially, we use a unique data set covering all type of banks in Vietnamese banking system that allows us to capture the effect of the most recent reform so-called "Restructuring financial institutions" on the productivity of Vietnamese banks. To do so, Malmquist indices analysis is applied to estimate the total factor productivity (TFP) change of 30 Vietnamese banks for the period from 2009 to 2014. A decrease of TFP of Vietnamese banking system was observed for the pre-restructuring period while it shows an increase since the restructuring program started regarding value-added and intermediate approaches. Noticeably, among these TFP increases, joint stock banks had the highest TFP improvement, with 13.5% refer to value-add estimation which focuses on maximizing banking services provided. As for the intermediate estimation, foreign and joint venture group showed the highest TFP increase of 49%. Our result confirms an appropriateness of the restructuring program on the performances of Vietnamese banks. It implies that, for the next stage of financial reform, policymakers should consider continuing the promotion policy of merger and acquisition, self-restructuring as potential tools to solve problems of existing weak banks and therefore be able to strengthen and make Vietnamese banking system more effective.

Key words: Vietnamese banks, Productivity, Malmquist index, Restructuring

I. Introduction

Performance evaluations of financial institutions which take into account of the appropriateness as well as the results of key reforms have become one of the main issues for the study on the financial industry. Issues in banking reforms vary among liberalization, privatization, recapitalization, merger and acquisition activities, and self-restructuring program. Although most transition economies have followed the same path for the banking sector's transformation the pace and results are different from one country to another. In fact, the answer to the question "whether these kinds of reforms have made banking sector perform better?" has been a debate in the literature. For instance, some previous studies suggested that financial reforms improve banking performance

(Berg *et al*., 1992; Kumbhakar and Sarkar, 2003; Das and Gosh, 2006). In contrast, other studies found that financial reforms have no effect or led to a decline in operating performance (Elyasiani and Mehdian, 1995; Fukuyama and Weber, 2002).

Throughout the past three decades, the Vietnamese banking system has witnessed various changes along with economic development. The Vietnamese Government has implemented banking reforms to improve the efficiency and the competitiveness of the banking system in the country. Recently, the State Bank of Vietnam started a program called "Restructuring financial institution 2011-2015". The main target for restructuring the financial institutions is to improve efficiency and financial performance of the banking system. Banking system's performance, therefore, becomes the extremely important information for not only regulators but also for the customers, managers, and even the shareholders.

In this study, the total factor productivity (TFP) change of Vietnamese banks is examined by applying Malmquist indices analysis, especially TFP is analyzed for two periods of time before and after the restructuring program started. The study tests whether the performance of Vietnamese banks has improved under the restructuring plan or not. Finally, considering main findings of the study, implications which aim to achieve better performance in banking operation are suggested.

The contribution of this study to the literature is that multiple approaches which are known as "intermediate approach" [2] and "value-added approach" [3] are applied to banking performance evaluations. In fact, previous studies rely mainly on the intermediate approach. Thus, it is expected to perform more comprehensive evaluation of banking performances. The study is also the first study that examines the performance of all banks including foreign players in the Vietnamese banking industry. Importantly, it provides evidence of TFP change of the banking industry in response to the first financial restructuring program since it would catch the movement in banking system's performance after starting the restructuring plan.

Our results show that although the TFP of Vietnamese banking system decreased in the pre-restructuring period, it has actually gone up since the restructuring program started regarding both approaches applied. The increase in TFP is mainly contributed by technical change rather than efficiency change. The improvement of TFP in the restructuring period confirms the suitability of the restructuring program on Vietnamese banks' performances.

The structure of the paper is as follows. The second section briefly introduces the background of Vietnamese banking system, focusing on banking reforms. A summary of the literature on the productivity of banking system is provided in the next section. In the fourth part, we present Malmquist indices methodology framework to estimate the total factor productivity change. Following that, the empirical model of banking operating evaluation, data used and our main findings are outlined in sections five and six, respectively. The last section brings the main conclusion and implications.

II. Reforms in Vietnamese Banking System

From 1990 onward, the Vietnamese government has conspicuously and purposely implemented reform policies directed toward deregulation, with the objectives of improving the efficiency and stability of the banking

system. The market has gradually been deregulated to allow entry of foreign banks. The State Bank of Vietnam has, since 2008, granted licenses to wholly foreign-owned banks. At the beginning of 2009, HSBC Bank (Vietnam) which is 100 percent owned by Hong Kong and Shanghai Banking Corporation Limited, became the first wholly foreign-owned bank operating in Vietnam. Following that, Standard Charted Bank, ANZ Bank, Shinhan Bank and Hong Leong Bank obtained a permit to establish wholly foreign-owned subsidiary banks incorporated in Vietnam. In their few years of operations, the wholly foreign-owned banks have reported making profits because of the high demand for foreign investors to open bank accounts with these banks for financing trade and foreign exchange purposes.

The next key movement was related to the privatization of the state-owned banks (SOCB) and the support of government for the listing of all local banks on the stock exchange market. The target of these policies was to reduce the state ownership in state-owned banks by 49% by 2010. Following that, the number of local banks that listed in the stock exchange market had raised from 6 in 2006 to 9 in 2016. The Government of Vietnam intends to partially privatize most SOCB's. However, such kind of plans seems to move slowly (Tran, 2015). The process of equitization would give permission for foreign investors to buy shares which cap foreign equity up to maximum 30 percent. In fact, Vietcombank's pilot initial public offering conducted firstly in December 2007. Vietinbank was equitized in December 2008. BIDV's took place in 2011. These three state-owned banks, Vietcombank, Vietinbank, and BIDV, are now listed on the stock exchange market.

Regarding the recent comprehensive reform, the schedule to restructure the system of financial institutions for the period from 2011 to 2015 was announced by the Prime Minister of Vietnam on March 2012 under Decision 254. The regulators announced banking industry consolidation as one of the main objectives of its restructuring plan. As a part of this plan, the State Bank of Vietnam aimed to reduce the number of local commercial banks to around 20 by 2017 through mainly merger and acquisition activities and self-restructuring. In details, the schedule of this program begins with the fact that Vietnamese commercial banks are classified into three groups from healthy, lack of liquidity and weak level according to their financial conditions and management. Following that, SBV tries to encourage healthy banks for their extension businesses, and refinance credit for the second level banks to solve liquidity problems. As for weak banks, they are encouraged to merge with other potential partners, voluntarily. If they fail to do that, they will be forced to be bought by SBV or to let other banks purchase their shares according to SBV's recommendation. Also, the minimum charter capital was raised from VND 1 trillion to VND 3 trillion and the minimum required capital adequacy ratio (CAR) was increased from 8% to 9% to meet this entry objective and raise barriers to entry to the Vietnamese banking industry. The main target of this restructuring program is to improve and strength operation performance of Vietnamese banking system, make them more effective.

III. Related Literature Review

Most of the empirical studies on performances of banks had concentrated on the change in technical efficiency by using either nonparametric or parametric method. In addition, studies examining effects of financial

reforms on banking performance found mixed results. A positive impact of financial reforms on banks operation was observed in the study of Berg *et al*., 1992; Kumbhakar, 2003; Sturm, 2002, Das and Gosh, 2006. For instance, Das and Gosh (2006) estimated the efficiency of commercial banks in India for the period from 1992 to 2002 after reform. They concluded that banks' performance improved in the case of India commercial banks. Also, Sturn (2002) considered the efficiency of banks in Australia during the post-deregulation period from 1988 to 2001. It showed an increase in efficiency in the post-deregulation period. By contrast, Bauer (1993) found that the efficiency of the banking system in the U.S. was unchanged by deregulation. Moreover, the efficiency of banks in Japan decreased between 1992 and 1996 (Fukuyama and Weber, 2002).

To the best of our knowledge, there were few studies that examined TFP change in South East Asia countries' banking systems under the financial reform. As for Vietnam, there were three papers that used Malmquist indices analysis to measure the change in TFP of banks. Nguyen (2007) first examined the efficiency of 13 Vietnamese commercial banks from 2001 to 2003 by applying Data envelopment analysis and Malmquist indices. It showed that TFP had increased by 5.7% over research time. On the other hand, Nguyen and De Bonger (2008) extended the sample size into 15 banks to estimate the TFP of Vietnamese banks from 2003 to 2006 and indicated a downward trend of TFP. Recently, Nguyen and Simioni (2015) used Fare-Primont index and focused on the evolution of productivity of Vietnamese local banks for the period between 2008 and 2012. The results from these studies complement each other to make observations on the development of the Vietnamese banking system. However, these three studies only focused on the operation of Vietnamese local banks, ignored the participation of foreign and joint venture banks which have gradually increased their market share. In addition, all of them had applied the same intermediate approach. Vietnam has recently completed a five-year restructuring plan and is now preparing for another stage of an overhaul. Therefore, it is necessary to conduct a study that suggests evidence showing the effect of restructuring program on banking system's performance. Its implications are useful to regulators when making decisions for the next plan of Vietnamese bank reorganizing.

IV. Methodology

The Malmquist productivity index can be used to identify productivity differences between two firms or one firm over two time periods. To estimate technical efficiency changes and technological changes over the period, this study applies decomposed Malmquist productivity index based on ratios of distance functions. Fare *et al*. (1994) specify and output-based Malmquist productivity change index as:

$$m_0(x^{t+1}, y^{t+1}, x^t, y^t) = \sqrt{\left(\left[\frac{D_0^t(x^{t+1}, y^{t+1})}{D_0^t(x^t, y^t)}\right]\left[\frac{D_0^{t+1}(x^{t+1}, y^{t+1})}{D_0^{t+1}(x^t, y^t)}\right]\right)}$$

Where x^t and y^t represent the input and output variables, respectively; Dt denote the function that projects the distance from the technology frontier to observation in the period t. The Malmquist productivity index (M) of total factor productivity (TFP) change is geometric mean of two indexes based on the technology used in period t and t+1, respectively. In other words, M=ET, Where M

is Malmquist productivity index x; E is change in efficiency from period t to t+1; and T is the measure of technical progress measured by shifts in the frontier from period t to t+1. When the reference technology is based on period t, then if productivity increases, implies that the Malmquist index is greater than 1. Productivity decrease in association with the Malmquist index lower than 1.

Regarding input and output choices, there is no perfect combination for banking efficiency evaluation. Reasonable arguments can be made for all approaches. From the literature, there are two common approaches to the input and output specifications of financial institutions. They are the production approach and the intermediate approach.

Sealey and Londley (1977) first introduced the intermediation approach which assumes that the main aim of banks is to transform liabilities (deposits) into loans (assets). Following this, inputs may include labor, capital, operating costs and interest expenses, while outputs are measured by monetary values of varied earning assets, for instance, loans and investment.

As for value-added approach which is also named as production approach, it focuses on the capacity of providing bank's services to their customers. Thus, the main aim of banks is to produce liabilities (deposits) as well as loans (assets) and other services. This approach was first applied to the banking sector by Benston (1965).

This study applied both intermediate approach and value-added approach when evaluating bank efficiency. While intermediate approach focuses mainly on the traditional business of banks, value-added approach estimation can widen the scope of the banking business. Therefore, findings from these both estimations are expected to bring a better understanding of bank performance.

Table 1 describes the outputs and inputs used in this study. Regarding the value-added approach, three outputs and three inputs are used in Model 1. Loans, deposits, and investment securities are considered as outputs. The three inputs are interest expense, operating expense, which includes staff expense, and provision for loan loss. Provision for loan loss should be an input of banks due to its value as an important source of information that reflexes the risky assets holding cost within bank system. On the other hand, Model 2 refers to the intermediation approach which emphasizes the main role of banks as the intermediations in the economy. Model 2 uses loans and investment securities as output while treating deposits, operating

Table 1. Variables used in the value-added and the intermediate approaches (Unit: VND1million)

	Outputs	Inputs
Model 1	Loans	Interest expense
Value-added approach	Deposits	Operating expense
	Investment securities	Provision for loan loss
Model 2	Loans	Deposits
Intermediate approach	Investment securities	Operating expense
		Equity

expense and also equity as inputs.

V. Data

A set of data was collected from the annual reports of the State Bank of Vietnam and also the annual financial reports of the individual banks for the sample from 2009 to 2014. The information of 30 banks, which include all types of banks in the Vietnamese banking industry (state-owned banks, the joint stock banks, joint venture and foreign banks), is examined in this study.

Table 2 lists the descriptive statistics of input and output data. The main feature we can observe in this table is the large dispersion of data for all inputs and outputs. The sample appears to be a mixture of relatively small-size banks with much larger ones.

VI. Empirical Results

The Malmquist productivity indices analysis is used to examine the change in the performance of Vietnamese banking system over time.

Table 3 presents the results of calculation of total factor productivity and efficiency changes of Vietnamese banks over a six-year period from 2009 to 2014. The Malmquist indexes represent the change in total factor productivity (TFP). The measured values of greater than 1 indicate improvements in productivity while it shows deterioration of productivity if the values are less than 1. Furthermore, the TFP change can be decomposed into efficiency change, which shows the catch-up to the productivity frontier in individual banks or the change in relative technical efficiency, and technical change, which shows the shift in productivity frontier. Similarly, both scores indicate an improvement if they are greater than 1 and deterioration if they are less than 1. The shift of the frontier reflects the technological progress that has happened inside the analyzed sample of firms or banks. The change in relative technical efficiency of a firm within the analyzed sample of firms during the course of time reflects the shift of the firm with respect to the efficient frontier of the sample at the beginning and at the end of the observed interval.

The empirical results are as follows: First, the TFP of Vietnamese banking sector has a slight increase over a six-year period from 2009 to 2014 regarding the value-added approach. On the other hand, according to the intermediate approach, it has a small decrease in TFP.

However, when we look at the TFP which was divided into the efficiency change (the catch-up effect) and the technical change (the frontier shift), the similar trend happened as for the value-added approach as well as the intermediate approach. It is the fact that the study period witnessed not only a slight drop in efficiency change but also an increase in the technical change. In addition, the technical change in the value-added approach is higher than that in intermediate approach. These lead to the observation that the TFP has increased in the value-added approach while TFP refers to the intermediate approach has decreased slightly over the research time.

In addition, taking a look at the TFP change over the whole period among three groups of banks, according to **Table 4**, joint stock banks are the only group which had an increase in TFP with value-added estimation while foreign & joint venture banks are the only group which had a rise in TFP according to intermediate approach. These observations may indicate that when focusing on providing total banking services, joint stock banks had the highest

Table 2. Descriptive statistics of inputs and outputs by year (Unit: VND 1 million)

Year	Variable	Obs	Mean	Std. Dev.	Min	Max
2009	Loans	28	34,200,000	50,100,000	317,529	201,000,000
	Deposits	28	37,400,000	50,800,000	677,246	187,000,000
	Investment securities	28	8,160,918	11,400,000	15,693	39,000,000
	Interest expense	28	2,504,064	3,412,539	138,921	15,900,000
	Operation expense	28	870,623	1,128,065	46,668	4,536,214
	Provision for loan loss	28	228,542	392,009	11,936	1,936,559
Year	**Variable**	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
2010	Loans	28	46,700,000	65,100,000	2,670,397	249,000,000
	Deposits	28	50,100,000	65,300,000	3,181,319	245,000,000
	Investment securities	28	14,300,000	15,600,000	814,407	61,600,000
	Interest expense	28	4,483,033	5,464,903	334,320	20,600,000
	Operation expense	28	1,262,330	1,731,350	73,997	7,197,137
	Provision for loan loss	28	343,155	617,561	3,113	2,659,495
2011	Loans	28	54,200,000	78,300,000	3,149,070	290,000,000
	Deposits	28	57,200,000	72,700,000	1,254,258	257,000,000
	Investment securities	28	16,000,000	16,000,000	1,160,363	67,400,000
	Interest expense	28	8,137,091	9,135,221	530,486	35,700,000
	Operation expense	28	1,778,941	2,130,186	208,355	9,077,909
	Provision for loan loss	28	657,104	1,387,455	0	5,063,769
2012	Loans	28	61,600,000	89,600,000	3,648,741	334,000,000
	Deposits	28	70,900,000	86,100,000	1,501,086	303,000,000
	Investment securities	28	18,100,000	21,300,000	1,185,667	78,500,000
	Interest expense	28	7,146,188	7,424,428	454,888	32,200,000
	Operation expense	28	2,048,117	2,246,548	296,265	9,435,673
	Provision for loan loss	28	741,976	1,168,127	0	4,357,954
2013	Loans	28	70,900,000	102,000,000	3,879,232	385,000,000
	Deposits	28	84,500,000	101,000,000	1,739,554	364,000,000
	Investment securities	28	21,600,000	22,200,000	1,049,068	83,000,000
	Interest expense	28	5,684,712	5,967,842	289,517	26,000,000
	Operation expense	28	2,130,761	2,351,955	298,497	9,909,654
	Provision for loan loss	28	915,416	1,493,851	0	6,482,862
2014	Loans	28	82,300,000	118,000,000	3,099,736	439,000,000
	Deposits	28	103,000,000	125,000,000	1,523,161	440,000,000
	Investment securities	28	26,800,000	25,800,000	2,128,387	93,400,000
	Interest expense	28	5,699,954	6,632,466	177,968	27,100,000
	Operation expense	28	2,282,988	2,499,849	319,213	9,804,496
	Provision for loan loss	28	1,087,930	1,649,266	0	6,985,696

Source: Financial statements of 30 Vietnamese banks in the period of 2009-2014

improvement in performance over the study period. Also, when emphasizing the main aim of banks as intermediations between depositors and borrowers the best improvement in TFP was observed in the foreign & joint venture group. On the other hand, the state-owned group, on

Table 3. Total factor productivity change, efficiency change effect and technical change effect of Vietnamese banking system from 2009-2014

	Value-added approach			Intermediate approach		
	effch	**techch**	**tfpch**	**effch**	**techch**	**tfpch**
2009-2010	0.920	1.124	1.034	1.057	0.995	1.051
2010-2011	1.059	0.737	0.780	1.008	0.929	0.936
2011-2012	0.924	0.978	0.904	0.979	0.854	0.836
2012-2013	1.058	1.177	1.245	0.974	1.088	1.059
2013-2014	0.996	1.259	1.254	0.956	1.174	1.132
Whole period 2009-2014	**0.989**	**1.037**	**1.026**	**0.996**	**1.001**	**0.997**

Source: Malmquist estimation by DEAP and author's calculation

Table 4. Total factor productivity change, efficiency change and technical change of Vietnamese banking system from 2009 to 2014 by groups of banks

	Value-added approach			Intermediate approach		
	effch	**tech**	**tfpch**	**effch**	**tech**	**tfpch**
State-owned	1.009	0.985	0.992	1.000	0.987	0.987
Joint Stock	0.982	1.047	1.031	0.992	0.999	0.992
Foreign & Joint venture	1.016	0.975	0.991	1.019	1.138	1.159
All banks	**0.989**	**1.037**	**1.026**	**0.996**	**1.001**	**0.997**

Source: Malmquist estimation by DEAP and author's calculation

average only showed a decrease in TFP over the research time for both approaches.

As mentioned earlier, this study aims to examine the performance of the Vietnamese banking system under the most recent and significant restructuring program started in the late 2011. **Table 5** summarizes the Malmquist decomposition results of the Vietnamese banking system in two separate periods of time: so-called pre-restructuring and restructuring period.

Regarding the period before the restructuring program, the TFP of Vietnamese banking system decreased in both value-added and intermediate calculations. The main reason for the drop in TFP is the significant decrease of technical change effect. Technical efficiency increased over that period.

In contrast, after the government took the action to restructure in the late 2011, the TPF marked a significant increase in 2011-2014, by, 16% in the value-added approach and 17% in the intermediate approach. Similarly, the TFP increase was mainly because of the significant contribution of technical change effect.

Furthermore, among three groups of banks, in the pre-restructuring period, only joint stock banks showed increases in TFP while these other two groups showed decreases in TFP for both intermediate and value-added approaches. However, in the restructuring period, three groups of banks had increases in TFP mainly

Table 5. Total factor productivity change, efficiency change effect and technical change effect of the Vietnamese banking system in the pre-structuring period and the restructuring period

		Value-added approach			Intermediate approach		
		effch	**tech**	**tfpch**	**effch**	**tech**	**tfpch**
Pre-restructuring (2009-2011)	State-owned	1.020	0.784	0.796	1.043	0.942	0.985
	Joint Stock	0.997	1.059	1.039	1.039	0.974	1.019
	Foreign & Joint venture	1.041	0.803	0.844	1.048	0.935	0.985
	All	**1.019**	**0.882**	**0.893**	**1.044**	**0.951**	**0.996**
		effch	**tech**	**tfpch**	**effch**	**tech**	**tfpch**
Restructuring (2012-2014)	State-owned	1.012	1.164	1.177	0.978	1.024	1.000
	Joint Stock	1.005	1.151	1.171	0.975	1.048	1.023
	Foreign & Joint venture	1.003	1.134	1.135	1.010	1.392	1.498
	All	**1.007**	**1.150**	**1.161**	**0.987**	**1.155**	**1.174**

Source: Author's calculation

because of technical change. Furthermore, taking a look at efficiency changes of Vietnamese banks in this restructuring period, it is clear that the efficiency measures of three groups of banks are greater than one in the value-added approach. It implies that the performance of banks in Vietnam improved under the restructuring program. It also somehow indicates a positive effect of the restructuring program by the government on the performance of Vietnamese banks. Noticeably, foreign and joint venture banks showed a significant increase TFP, by 50%, regarding intermediate approach. This observation implies that despite the shorter participating time in the banking market, foreign and joint venture banks have started improving their business operating as financial intermediaries in the local market since reform conducted.

VII. Conclusion

According to Malmquist productivity index analysis, there was a difference in TFP changes of Vietnamese banks in the two periods examined. Both value-added and intermediate approach estimations observe the same trend. In fact, in the pre-structuring period, this Malmquist index was less than 1, implying a decrease in TFP while it has increased by 16.1% and 17.4% refer to value-added and intermediate estimation, respectively, in restructuring period. The intermediate approach emphasizes the main role of banks as intermediaries between borrowers and savers. As for this traditional focusing estimation, foreign and joint venture group showed the highest improvement in TFP while the most successful one in TFP change in value-added term was the joint-stock group. The results confirm that the restructuring has a positive effect on TFP changes of Vietnamese commercial banks.

Observations figured out from the study provide evidence showing a positive effect of the restructuring program, which has the main aim to raise the stability and efficiency of the banking system, on the performance of banks in Vietnam. The fact that foreign and joint

venture group seem to be successful in TFP improvement implies banks which have foreign shares in capital structure might operate more effectively. The government should consider promoting foreign investors to buy more shares in local banks, especially in small banks or existed weak banks by increasing the permitted maximum share of a foreign investor's equity in a local bank.

Notes

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2) The intermediate approach focuses mainly on the traditional business of banks, considering the main aim of banks is transferring deposits into loans. Deposit is referred as input while loan is considered as output.
3) The value-added approach considers providing all bank services as the main function of banks. Thus, loan and deposit are referred as outputs in this approach.

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Appendix

List of banks in the sample

ID	Name of Bank
1	Asia Commercial Joint Stock Bank
2	An Binh Commercial Joint Stock Bank
3	Viet Capital Commercial Joint Stock Bank
4	LienViet Commercial Joint Stock Bank
5	Vietnam Bank for Industry and Trade
6	Joint Stock Commercial Bank for Investment and Development of Vietnam
7	Dong A Commercial Joint Stock Bank
8	Southeast Asia Commercial Joint Stock Bank
9	The Maritime Commercial Joint Stock Bank
10	Tien Phong Commercial Joint Stock Bank
11	Viet Nam Technological and Commercial Joint Stock Bank
12	Nam A Commercial Joint Stock Bank
13	Joint Stock Commercial Bank for Foreign Trade of Vietnam
14	Mekong Development Joint Stock commercial Bank
15	Housing development Commercial Joint Stock Bank
16	Orient Commercial Joint Stock Bank
17	Military Commercial Joint Stock Bank
18	Vietnam International Commercial Joint Stock Bank
19	National Citizen bank
20	Saigon Bank for Industry &Trade
21	Saigon-Hanoi Commercial Joint Stock Bank
22	Saigon Thuong Tin Commercial Joint Stock Bank
23	Viet A Commercial Joint Stock Bank
24	Vietnam Commercial Joint Stock Bank for Private Enterprise
25	Petrolimex Group Commercial Joint Stock Bank
26	Viet nam Commercial Joint Stock Exim
27	Indovina Bank
28	HSBC Vietnam

China-Arab states Energy Cooperation under the Belt and Road Initiative: Chances, Challenges and Policy Implications

Liu Tingting

Abstract

Since China became a net importer of oil in 1993, China and the Arab countries have been conducting energy cooperation on the basis of mutual economic interests. Under the vigorous promotion of the China-Arab States Cooperation Forum in the 21st century, the cooperation in the past two decades has achieved fruitful results, and mutual benefit and win-win has created a strong vitality for China-Arab energy cooperation. Nowadays, the proposal and implementation of the Belt and Road initiative has once again provided a new opportunity for energy cooperation between the two sides. It is undeniable that opportunities are always accompanied by risks. China-Arab energy cooperation still faces challenges such as geography, competition, internal affairs, and so on. However, the prospects for China-Arab energy cooperation are considerable. In the future, the two sides should seize the new platform of the Belt and Road and focus on building a mutually beneficial, safe, reliable and long-term friendly China-Arab energy strategic cooperation relationship.

Key words: Energy Cooperation, The Belt and Road Initiative, Basis, SWOT Analysis, Prospect

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Glossary

B&R: The Belt and Road Initiative
TPP: Trans-Pacific Partnership
TTIP: Transatlantic Trade and Investment Partnership
GCC: The Gulf Cooperation Council
CASCF: China-Arab States Cooperation Forum
NOCs: National Oil Companies
CNPC: China National Petroleum Corporation
Sinopec: China Petroleum and Chemical Corporation
CNOOC: China National Offshore Oil Corporation
IMF: International Monetary Fund
WB: World Bank
AIIB: Asia Infrastructure Investment Bank
ADB: Asia development bank
CBD: China Development Bank
EXIM: China Export-import Bank
WTO: World Trade Organization
BP: British Petroleum
EIA: The U.S. Energy Information Administration
ISIS: Islamic State of Iraq and al-Sham
UAE: United Arab Emirates
LPG: Liquefied Petroleum Gas
GDP: Gross domestic product
EAEU: Eurasian Economic Union
OECD: Organization for Economic Cooperation and Development
OPEC: Organization of the Petroleum Exporting Countries
CASSTTC: China-Arab States Technology Transfer Center
FPCL: Fujian Petrochemical Company Limited
YASREF: Yanbu Aramco Sinopec Refining Company
SGI2: Saudi Gas Initiative 2
WTI: West Texas Intermediate
EIU: The Economist Intelligence Unit
RMB: Renminbi
RQFII: RMB Qualified Foreign Institutional Investor

Chapter I: Introduction

1.1 Background

China's Belt and Road initiative — the Silk Road Economic Belt[1)] and the 21st-Century Maritime Silk Road[2)] — (hereinafter referred to as B&R), proposed by President Xi Jinping in 2013 and then issued in an official document from Chinese government in 2015,

which presents a perspective for future regional cooperation of Eurasia. Looking at the map below (**Figure 1**), the Belt and Road initiative is through Eurasian continent, the two ends are Europe and East Asia with strong economy and booming energy demands, the middle ground of the line is the developing countries (such as the Middle East, Africa and Central Asia) with high development potential and abundant energy resources. So to speak, the B&R closely links the energy consumption countries and production countries, which can effectively optimize the global energy governance system and promote energy cooperation.

Nearly five years since this program was proposed, it already drew worldwide attention and many countries have generally given high marks on the Belt and Road initiative. According to Helen Chin & Winnie He's article, 65 countries along the Belt and Road will participate in this initiative.[3] Also they identified 48 countries have taken part in or showed interest towards B&R initiative.[4] Among all countries, the Arab states[5] are important participants of this project, which occupy crucial geographical position of the world map and possess rich oil and gas resources with high reserves, production and export volume. On the one hand, China and the Arab states have common interest claims; these advantages have virtually helped the energy cooperation between China and the Arab states. Besides, there has been a solid historical foundation for energy cooperation between China and Arab countries. From the establishment of strategic partnership to the formation of a high-level China- Arab Cooperation Forum in 2004, China and Arab countries have launched a series of energy cooperation to promote the development of China and Arab countries. On the other hand, energy cooperation is an important part of whole strategy. The B&R initiative has its unique connotation and characteristic in China-Arab energy cooperation, which not only brings new development opportunities to China-Arab energy cooperation but also constrained by geopolitical, competitive and other risks.

Source: Xinhua, http://www.xinhuanet.com/english/2016-06/24/c_135464233.htm

Figure 1. The Map of the Belt and Road Initiative

1.2 Significance of the Study

This dissertation aims to investigate the chances and challenges of China-Arab energy cooperation under the Belt and Road initiative. Since B&R initiative was proposed in 2013, until now, China and the Arab states already reached a consensus to actively promote energy cooperation and jointly build the Belt and Road. What's more, from a great national strategy into practice, it can't be separated from a comprehensive and detailed theoretical basis and specific classified study. From strategy formulation to strategy implementation, a large quantity of literatures and research achievements as academic supports are needed. However, I found that the researches about China-Arab energy cooperation combining the B&R initiative were not abundant. Therefore, this thesis has a realistic theoretical significance. In addition, during the process of energy cooperation between China and the Arab states, various problems bound to be encountered. Thus this article will give policy recommendations in light of the development strategy of the B&R, with far-reaching practical significance.

1.3 Literature Review

1.3.1 The Connotation and Strategic Significance of the Belt and Road Initiative

He Maochun & Zhang Jibing (2013), scholars from Tsinghua University, considered the concept of the new Silk Road Economic Belt from the perspective of historical inheritance and international cooperation and deepened the connotation of B&R in the vertical and horizontal comparison. On the one hand, the development of science and technology today laid the foundation for the revival of the Silk Road. On the other hand, the concept of B&R not only conformed to the development trend both at home and abroad but also considered balanced development of politics, economy and culture. Based on the analysis and forecast of future development trends, they believed the prospects for the "Belt and Road" would be substantial. By studying the model of international regional economic cooperation under the new situation, Shen Xianjie (2014) analyzed the important strategic significance of China's implementation of B&R initiative. He found that China could calmly cope with the pressure exerted by the United States on TPP and TTIP, and make China seize the initiative in an open international environment.

1.3.2 Current Status of Energy Cooperation between China and the Arab states

At present, there have been some relevant discussions and preliminary conclusions about the history, current situation and prospects of China-Arab countries relations among scholars. As pointed out by Shichor (1998), due to the constraints of domestic and foreign factors, the economic cooperation between China and the Arab countries was extremely limited before China's reform and opening up. Especially in the 1950s to 1960s, the close relations between the two sides were mainly motivated by political and strategic factors. Correspondingly, the political relations between the two parties also indirectly influenced the economic relations between the two sides. Another professor Wu Bingbing (2011) indicated that from 1958 to 1990, Iraq had been the focus of China's policy in Gulf region. While with the intensification of economic and energy interests, the relations between China and the Arab states were gradually heating up.

Since becoming a net importer of oil in 1993, China's dependence on oil imports by Arab countries has been rising. Oil has become the largest trade commodity of economic cooperation between China and Arab countries.

ME. Herberg (2009) and others called the energy relations between Asia and Arab countries as "The New Energy Silk Road." He believed that the strong interest in the emerging market economies such as China, which reflected the geopolitical "Looking East" tendencies of Arab countries.

Regarding to the impact of the energy cooperation between China and the Arab states, it always remained two different camps. Some American scholars were pessimistic about the bilateral relations between China and the Arab states symbolized by the "New Silk Road." They were more interested in the impact of China-Arab countries energy cooperation on the United States. The focus of the debate was whether China's growing energy demands and the consequent engagement of China with the Arab states would threaten the U.S. oil hegemony in the Arab region and affect U.S. energy imports from the Arab oil-producing countries. In response, Zhao Xuchi (2016) said that China and the United States each has important interests in Middle East. In the foreseeable future, the dominance of the United States in the Middle East would not change. With U.S. strengthening military presence in this region, it together with certain western countries, would attempt to crowd out China in Middle East.

However, some scholars hold optimistic attitudes about this. Taking Saudi Arabia as an example, it has become an important cooperative partner that China sought in the Arab world, and the political ties between the two countries have also been increasingly strengthened. Al-Tamimi (2013) conducted an in-depth study of the nature of Sino-Saudi relations in response to the thinking of the U.S. strategic community about the close relations between China and Saudi Arabia. In his view, China's economic cooperation with Saudi Arabia was greater than its political contacts. The approach between China and Saudi Arabia didn't intend to weaken the U.S. power. Accordingly, Afshin Molavi (2011) argued that while shaping the new geopolitical landscape between East Asia and Middle East, this New Silk Road would also intensify regional stability and global growth.

With regard to the future of energy cooperation between China and the League of Arab States, most scholars generally believed that there was a unique advantage and a bright future for the energy cooperation between China and the Arab states. Scholars Sun Degang & Yahia ZOUBIR (2014) suggested that sharing of common values emphasis on national dignity, revitalization, political multi-polarity, diversity of development modes and non-interference policy were positive factors that can promote China-Arab states energy cooperation. Wu Si'ke (2015), Chinese former envoy to the Middle East, also mentioned that security coordination, economic and trade cooperation and cultural exchanges were important strategic docking between China and the Middle East region under the B&R framework.

Under the new situation, the implementation of the Belt and Road strategy undoubtedly opened up new opportunities for China-Arab states energy cooperation. In his reception to the Gulf Cooperation Council (GCC) delegation, Xi Jinping pointed out that China would be willing to work jointly with the GCC to build the B&R initiative and pave the way for energy cooperation between two sides. The GCC representatives also expressed their strong desire to promote energy cooperation with China. Xi also stressed at the 6th Ministerial Meeting of China-Arab States Cooperation Forum in 2014 that China is ready to deepen cooperation with the Arab states in oil and gas,

infrastructure, trade and investment, nuclear power, aerospace and satellite and new energy.[6)]

Qian Xuming pointed out in his article (2017) that China has actively utilized the existing bilateral and multilateral cooperation mechanism to promote international energy cooperation under the context of B&R initiative. In Qian's another article (2016), he specially demonstrated that the energy relation with the Middle East countries lay at the core of B&R initiative. Moreover, researcher Yu Jianhua (2014) indicated that along with the new opportunities of the common construction of the Belt and Road, the two sides will build mutually beneficial, safe, long-lasting Sino-Arab energy strategic partnership in the future. Thus, the implementation of the B&R strategy has far-reaching practical significance for developing international energy cooperation among China and other countries.

1.3.3 Challenges of Energy Cooperation between China and the Arab states

While fully grasping the opportunities of China-Arab energy cooperation brought by B&R Initiative, we should also give full attention to existing problems and potential challenges. Thus experts and scholars at home and abroad have mainly explored from the perspective of energy security and energy strategy.

About energy security, Yang Guang (2004) found that as China relied more and more on oil imports from Arab countries, the following problems eventually began to emerge: seriously unbalanced China's trade with oil-exporting countries, the environmental pollution in the process of import and the impact of instability in the Arab countries on oil prices. Jin Liangxiang (2006) believed that the cooperation between China and Middle East in the energy sector was constrained to various factors, such as the turbulent political environment in the Arabic countries, the backward infrastructure, the bottleneck of transportation and the cooperative mode of energy companies. The study by Scholars Sun Degang & Yahia ZOUBIR (2014) also showed that the intrinsic internal discords among Arabic countries, low integration and divergent attitudes towards the West were non-negligible negative factors during the process of energy cooperation. Besides, some potential challenges were stated in Qian Xuming's (2014) study, such as: complex and unstable energy cooperation environment, the distress if non-traditional security threats and the interference of big powers, which would hinder the process of energy cooperation.

By summarizing above relevant literatures and the discussions on the energy cooperation between China and the Arab states, it is not difficult for us to find the energy cooperation between two sides has been facing with both opportunities and challenges. Therefore, what those chances and challenges are, how to calmly deal with these risks under the strategy of Belt and Road, and how to improve China- Arab energy cooperation to a new level will be the main discussion of this dissertation.

1.4 Content

The whole thesis composed by five chapters. First chapter is introduction, which elaborates the background, the significance of the topic, analysis methodology and some limits of my research. Also, some previous studies are summarized in this chapter. The second chapter is to describe the basis for energy cooperation between China and the Arab states. Next, chapter three talks about case studies of energy cooperation between China's energy companies (represented by CNPC and Sinopec) and Arab countries. By using the SWOT method, this

part analyzes the favorable and unfavorable factors existing in the process of energy cooperation. Final chapter is about the policy recommendation. Under the background of Belt and Road Initiative, I will put forward some suggestions from five aspects, which related with five priorities that President Xi mentioned in his speech at Nazarbayev University in Astana of Kazakhstan. Last but not least, I will give some conclusion remarks.

1.5 Methodology

In my dissertation, I will mainly use qualitative research method—case study approach, and SWOT analysis method will be applied to analyze two cases, that is, the energy cooperation between China and Saudi Arabia and Sudan. All data collected from World Bank, IMF, AIIB, BP, EIA, CHINA CUSTOMS and other scholars' articles. Literature review based on some mainstream papers, reports, books and journals from JSTOR/ Google scholar or other official websites.

1.6 Limitation of the Study

Due to the limited space of articles and limited knowledge, I could not talk about all cases of energy cooperation between the Arab oil-producing countries and China, only a few representative countries were selected in the case analysis. Also, because of Belt and Road Initiative is remaining a ongoing process, which the progress and final results are not easily predictable. Thus my dissertation merely gives preliminary study, prediction and suggestion. And the author hopes this thesis will cast a brick to attract jade and stimulate more scholars to do more deepen studies.

Chapter II: The Basis for Energy Cooperation between China and the Arab States

2.1 The Strained U. S. -Arab relations Urged Arab Countries to Seek New Partners

(1) The Bush Administration's Foreign Policy towards the Arab countries

The September 11 attacks were a turning point, which affected President George W. Bush to make readjustments of U.S. grand strategy and form a new basis for U.S. foreign policy. He had to alter his focus from domestic issues, such as education and social security to international concerns.[7] Very soon, as a response to the attacks, the more comprehensive Bush Doctrine was announced. And the main characteristics of Bush's foreign policy were explicit: unilateralism and anti-terrorism. Based on neo-conservatism, Bush preferred the solution of prevention and unilateral military actions (without the approval of international society) to guarantee U.S. national security.[8] Also, he believed that the United States has been playing the role of world hegemon; it has right, responsibility and overwhelming power to combat terrorism and promote democratization and regime change in the Middle East.[9]

As a result, Bush initiated the invasion of Afghanistan in 2001 and Iraq in 2003 subsequently, which not only made the United States bogged down in Iraq and Afghanistan for a long time, but also caused turbulence in the Arab world, such as the instability in Iraq and the suspension of Palestinian-Israeli peace talks[10], have become increasingly prominent. Such interventions just left irreparable harm on the hearts of the Arab people. Gradually, the rising dissatisfaction within the Muslim community has left a vacuum in the strategic security of

the Arab world and provided fertile ground for much more terrorist violence. Meanwhile, the anti-US sentiment around the world reached unprecedented high. As John Rielly's research mentioned, a poll conducted by Stern magazine in 2007 indicated that most Germans considered the U.S, as a greater threat to world peace than Iran, and many other polls proved that this sentiment was shared throughout most of Western Europe and many other parts of the world.[11)]

(2) The Obama Administration's Foreign Policy towards the Arab countries

In the aftermath of the Bush administration, the financial crisis erupted in 2008, and the rise of emerging economies formed a considerable impact on the United States. Along with the Afghanistan war and the Iraq war remained unresolved, which not only widened the mistrust and animosity between America and Muslim peoples and societies,[12)] but also weakened the dominance of the United States in the international order, Barack Obama has sought to adjust American foreign policy for improving the image of the United States.

Obama's grand strategy was more moderate, he has attempted to get rid of the unilateral rhetoric of the War on Terror and emphasized to work with allies to seek legitimacy.[13)] In dealing with the relation with the Arab world, he actively called for mutual understanding, advocated the withdrawal of troops from Iraq and promoted to revive peace talks between Palestine and Israel from 2010. Under Obama's efforts, all U.S. soldiers withdrew from Iraq on 18 December 2011, almost nine years military presence ended. However, not all endeavors achieved expected results, for example, Palestinian-Israeli peace talks have not made substantial progress and terrorist attacks resurged and frequently occurred. The fact was that Arab world was still in turmoil, leading to the rising of anti-American sentiment of the Arabic public. U.S. policy on Arab nations failed to win the heart of Arab world, it just brought casualties, destruction and displacement. In addition, for the United States, the study of Mark Boris Andrijanič (2015) demonstrated that the American energy revolution has increased its capacity of self-reliance, and the reduction in oil imports have also contributed to the change of the U.S. foreign policy, which has enabled the U.S. to preform a more independent and less involved role in the Arab region.[14)] While for the Arab states, the impacts of American departure from this region were profound, which would gradually urge countries like Bahrain and Qatar to seek new regional powers as military protectors or drive to close relations with China.[15)]

(3) China's Foreign Policy is in the Interest of the Arab people

With the advancing of China's reform and opening up, China's economy has achieved remarkable success in recent decades. According to China's Arab policy paper released in January 2016, China established diplomatic ties with all 22 Arab countries since 1956. Over the past 60 years, China has always adhered to the "Five Principles of Peaceful Coexistence"(proposed by Premier Zhou Enlai in 1953), namely, "mutual respect for sovereignty and territorial integrity, mutual non-interference in each other's internal affairs, mutual non-aggression, equality and mutual benefit, and peaceful co-existence"[16)] in dealing with the regional hot-spot issues. Thus I will list main regional conflicts and briefly describe China's stance towards those issues in **Table 1** below.

As scholar Wang Jinglie written in his article (2010), China's sincerity in dealing with

Table 1. China's Stance towards Main Region Conflicts in the Arab Region

Main regional conflicts	Participation of conflicts	China's stance
Syrian Crisis	The United States, Syrian opposition groups, Bashar al-Assad Regime, Russia, UN, Gulf Cooperation Council, EU	China vetoed against UN resolutions, opposed any military intervention, and addressed problems through dialogues and political means.[17]
Palestine-Israel Issue	Palestine, Israel	China insisted a neutral place and offered help with negotiation multiple times.[18]
South Sudan-North Sudan Conflict	Northern Sudan, Southern Sudan	China played as a mediator between two sides and it actively performed the responsibility of great power.
Darfur Issue	Sudanese government (military group), JEM (non-Arab Muslim)	China adopted a "responsible stakeholder role" to urge the Sudanese government to improve the humanitarian situation; China insisted that the essence of issue is the issue of development and continued to support the development of this region.[19]
ISIS	Syria, Iraq, Libya, ISIS	China actively participated the international cooperation of anti-terrorism activity and safeguard world peace.

Source: based on reference articles and author's own summaries
Note: Since Iran and Afghanistan are non-Arab states; I didn't list them in the table. However the existing issues remained considerable. Regarding to Iranian nuclear issue, China didn't favor unilateral sanctions against Iran and final settlement should basis on dialogue, negotiation and other means of cooperation. (Mu Chunshan, (2013), *The Iranian Nuclear Question: China's Perspective*, The Diplomat.) In terms of conflict between Afghanistan government and the Taliban, China kept low-key positions on Afghanistan and refused military involvement and take cautious approach to the Taliban, however China actively joined the postwar rebuilding of Afghanistan. (Zhao Huasheng, (2012), *China and Afghanistan: China's interests, stances, and perspectives*.)

relationships in common grounds, and its firm position on opposing imperialism and colonialism and supporting the oppressed people fighting for national independence and liberation, won the general praise of Arab countries.[20] To sum up, in my understanding, the relations between the United States and Arab countries have become increasingly rigid; the historical relations that

Arab countries have relied on the United States might not last long. While China has attained outstanding achievements after 30 years of reform and opening up, the increasing influence in international affairs and the peaceful foreign policy advocated has won Arab people's heart. As a more mature and more responsible major power, China has a great attraction to Arab countries and has gradually become a better candidate for developing bilateral or multilateral cooperation with the Arab states.

2.2 The Rising Importance of the Arab region to China

Since China has been pursuing Periphery Diplomacy, an enabling international environment was significant for achieving China's rise and peaceful development. The Arab region, shared tradition and comprehensive friendship with the link of ancient Silk Road, has gradually stepped into China's diplomatic horizon.

Politically, the countries in the Arab region and China all belong to the developing countries, they have common interest demands and all long for peace and development. At the same time, because of its unique geographical advantages, the Arab region has always been political whirlpool center of big power game and the places where civilization of East and West meets for centuries. After the founding of New China (1949), the Bandung Conference, which took place in April 1955, has not only witnessed both sides supported each other in the liberation struggle for national independence, but also shared similar position and view towards many international issues. For example, the Chinese government supported Egypt to recover its sovereignty over the Suez Canal and Palestinian people fight for the national rights, their friendship stood the test of time and became constantly deepened and profound. As of 1990, China has already established diplomatic ties with all member states of the League of Arab States and the close development of their relations has laid a firm foundation for the economic and trade development. The good and close diplomatic relations between China and the Arab states have not only helped to promote the influence of developing countries in international affairs but also benefited to establish a more justice and a more reasonable new international political order.

Economically, since China begun reforming and opening up in 1978, and the China-Arab States Economic and Trade Forum established in 2010, China-Arab economic and trade cooperation made fruitful achievements under the joint efforts.[21] In recent years, the trade volume between China and Arabic states has kept rising sharply. For instance, referring to **Table 2** below, in 2004, the volume of Sino-Arab trade amounted merely $36.7 billion but in 2011 it reached nearly $200 billion.[22] In 2016,

Table 2. China-Arab Trade Volume (Unit: Billion Dollars)

Year	2004	2005	2006	2007	2008	2011	2012	2014	2016
Volume	36.7	51.3	65.4	80	132.8	200	222	312	171.1

Source: Data collected from Sebastian Hornschild, (2016), *China in the Middle East: not just about oil*; Mohammed Numan JALAL, *The China-Arab States Cooperation Forum: Achievements, Challenges and Prospects*, Journal of Middle Eastern and Islamic Studies (in Asia) Vol. 8, No. 2, 2014

China-Arab trade volume totaled 171.14 billion US dollars, and the value of newly signed project contracting agreements stood at 40.37 billion US dollars, up by 40.8%.[23] "China imported 380 million tons of oil in 2016, including 150 million tons of oil imported from Arab countries, accounting for 40 percent of China's total imports", Yang Fuchang, the former Vice Minister of Foreign Affairs, demonstrated in symposium "Belt and Road Initiative: Towards Greater Cooperation between China and the Middle East".[24] According to statistics from the UAE Ministry of Economic Affairs, between 2014 and 2016, UAE-China bilateral trade volume totaled 52 billion dirhams (about 141.8 billion U.S. dollars). For three consecutive years, China ranked first in the UAE's major trading partners.[25] With the size of China-Arab trade was enlarging, the prospect for cooperation was bright as well, which provided a solid foundation for further energy cooperation between two sides.

Culturally, Arab countries and China with time-honored history and civilization, have also conducted dialogues on many occasions, broadened the channels of people to people exchanges and deepened the friendship between two sides. In fact, under the promotion of the China-Arab States Cooperation Forum (CASCF), China and Arabic region have held three sessions of Arabic Art Festival and Chinese Art Festival respectively, five sessions of China-Arab Friendship Conference and other events that were beneficial to the cultural communication. These measures were true portrayal of the cultural exchange between China and Arabic nations, which vividly demonstrated diverse civilizations should make concerted efforts to learn from each other, seek common ground and reserve differences to achieve common development.

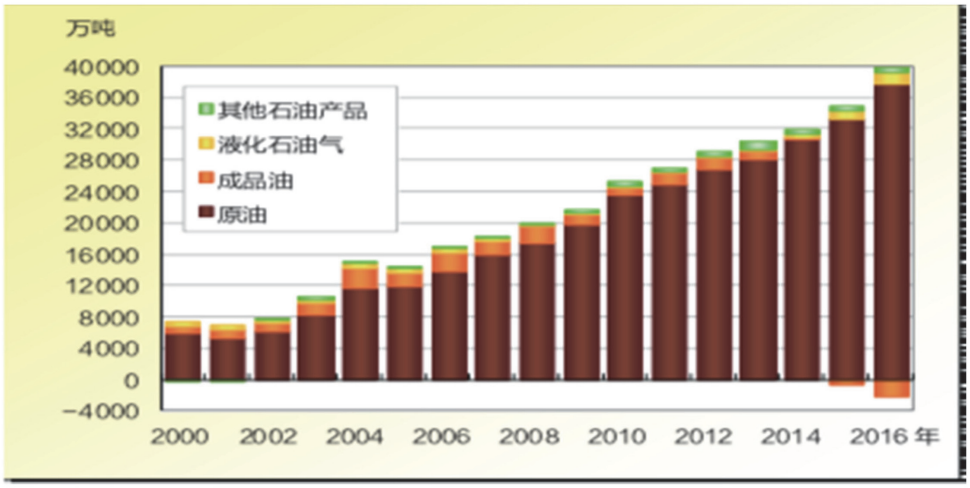
2.3 The Outstanding Complementarity in Energy Structure between China and the Arab states

According to BP Statistical Review 2017, China remained the world's largest energy consumer, accounting for 23% of global energy consumption and contributing 27% to global energy demand growth in 2016. Although Chinese economic development demonstrated a new trend of medium-high rate of growth, companying with the weakening energy demand growth; the situation that China's energy production rate couldn't catch up with the growth rate of energy demand has still not been greatly improved. For example, China's net oil imports (included crude oil, refined oil, LPG and other products), exceeded 300 million tons for the first time in 2014, and reached 378.3 million tons until 2016 (**Figure 3**), a year-on-year increase of 9.9%, with a high degree of import dependence of 67.3%, almost the highest in its history (**Figure 2**). However, oil production declined by 310 Kb/d to 4 Mb/d in 2016, the largest annual decline ever.[26]

What's more, the proportion of coal was too large, the contradictions of energy structure of other small proportion of energy, such as oil and natural gas, have become increasingly prominent. In terms of clean energy sources, such as natural gas and nuclear energy, the gaps between production and demand were relatively large. It is predicted that by 2020, China would not only continue to maintain its position as world's largest importer of crude oil, but also become the largest importer of natural gas.[27] The first two decades of the 21st century stands for a critical period for China to build a well-off society in an all-around way and speed up its industrialization. Thus the solution to the energy issue concerns the development of China's economy, the improvement of people's living

Source: Tian Chunrong, *Analysis of China's Oil Import and Export Situation in 2016* (田春荣 , 2016 年中国石油进出口状况分析) Note: 消费量 : Consumption, 净进口量 : Net Import, 进口依存度 : Import Dependency Ratio

Figure 2. China's Oil Import Dependency Ratio 2000-2016

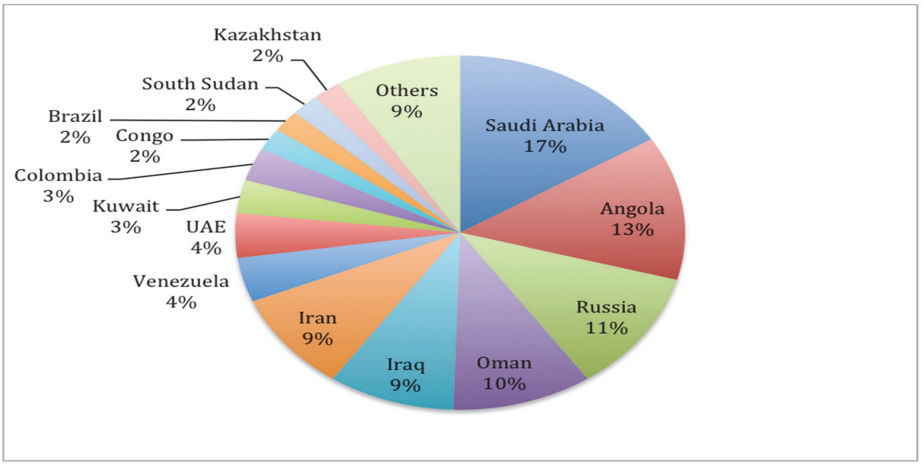


Source: Tian Chunrong, *Analysis of China's Oil Import and Export Situation in 2016* (田春荣， 2016 年中国石油进出口状况分析) Note: 成品油 : Refined Oil, 原油 : Crude Oil, 其他石油产 : Other petroleum products, 液化石油气 : Liquefied Petroleum Gas (LPG).

Figure 3. China's Oil Net Import 2000-2016

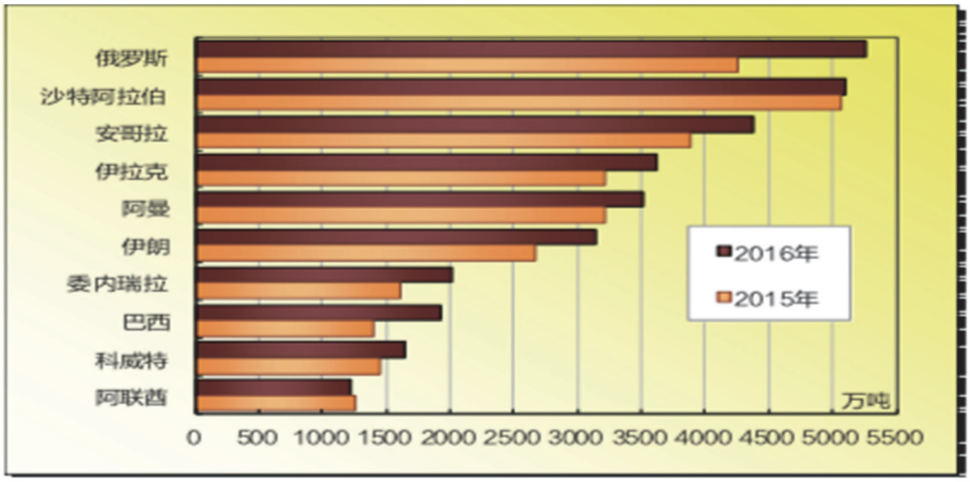
standard and even the rejuvenation of a nation.

The League of Arab States, including 22 Arab countries, accounts for the large proportion of China's oil import sources, playing the pivotal role. It is clear from (**Figure 4**) below, the Arab League accounted for about 44% of China's oil import share in 2014, about 53% if including Iran, that is, almost half of China's oil was imported from the Middle East. Since 2002, Saudi Arabia has been China's largest



Source: Facts Global Energy, Global Trade Information Services, Inc.

Figure 4. China's crude oil imports by source in 2014



Source: Tian Chunrong, *Analysis of China's Oil Import and Export Situation in 2016* (田春荣， 2016年中国石油进出口状况分析) Note: 俄罗斯 : Russia; 沙特阿拉伯 : Saudi Arabia; 安哥拉 : Angola; 伊拉克 : Iraq; 阿曼 : Oman; 伊朗 : Iran; 委内瑞拉 : Venezuela; 巴西 : Brazil; 科威特 : Kuwait; 阿联酋 : UAE.

Figure 5. Top 10 Oil Suppliers of China in 2016

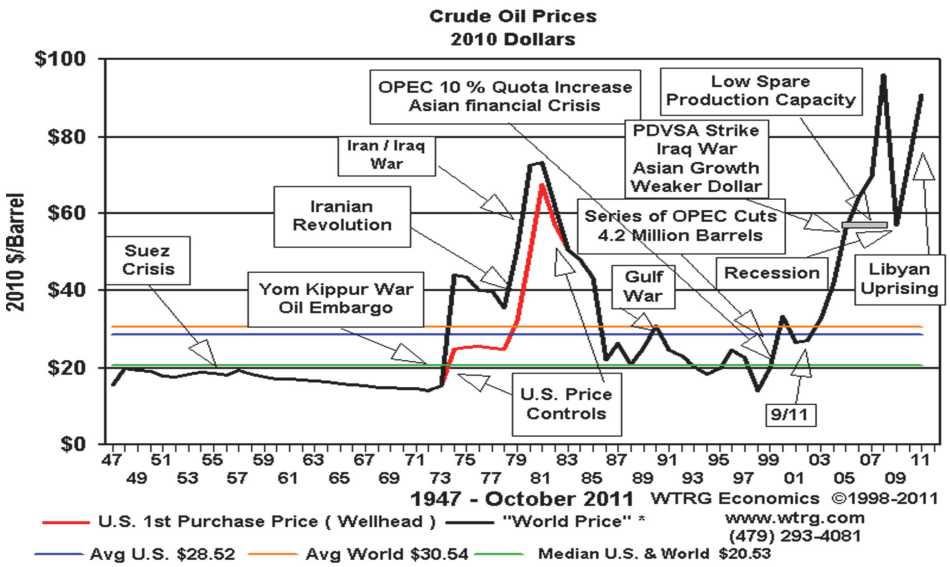
oil supplier. Among the top 10 oil suppliers to China in 2014, Saudi Arabia, Oman, Iraq, United Arab Emirates and Kuwait ranked No. 1, 4, 5, 8 and 9 respectively. Even though in 2016, China's largest supplier of imported crude oil was replaced by Russia, Saudi Arabia has remained one of top suppliers in the list. (**Figure 5**)

Judging by the current economic developments both at home and abroad, China urgently needs to conduct all-round and friendly

cooperation with the Arab League, which includes the energy sector. The Arab League, which is dominated by oil and gas resource countries, also sincerely wishes for energy cooperation with China.

First of all, the main pillar industries of these Arabic countries are oil and gas resources. For example, Saudi Arabia heavily relies on oil revenues, accounting for 88% of total export earnings, about 75% of state revenues and 40% of GDP.[28] They had to seek a long-term, secure oil and gas export market by using their own unique resource advantages and developing their economies through the implementation of sustainable energy development strategies. However, having experienced the downturn in oil prices between the 1980s and 1990s (**Figure 6**), the oil-producing countries in the Arab region were unable to make ends meet, so the idea of changing the oil industry system and adjusting energy strategies was increasingly pressing. Taking Saudi Arabia as an example again, the sharp decline of oil price led to dramatic reduction of its oil revenues, then causing the lower GDP growth, as well as higher budget deficit.[29] As a result, these oil-producing countries had to endeavor to increase their production capacity and seize the leading position in the world crude oil market. They had to actively seek for new and safe investment destinations, intensify overseas investment and strengthen export capacity; broaden diversified export channels and build an oil and gas industry integrating exploitation, refining, transportation and marketing system. Moreover, due to the shale gas revolution, the U.S. dependence on oil and gas in the Arab region has been reduced, which led to those Arab states become more rely on Asian market.[30]

In addition, in dealing with Arab countries' matters, China won the unanimous appreciation of the Arab people for its great power, but



Source: James L. Williams, *Oil Price History and Analysis*, WTRG Economics.
http://www.wtrg.com/prices.htm

Figure 6. Crude Oil Prices from 1947 to 2011

also attracted the Arab people because of its rising economy. More and more Arab countries were optimistic about China's oil and gas consumption market and actively carried out energy cooperation with China on energy exploration, exploitation and extraction. When Vice Foreign Minister Zhang Ming visited Oman in 2015, Oman has expressed its willingness to strengthen cooperation with Chinese side in the fields of production capacity, infrastructure construction, energy, technology transfer and human resources development.[31] This showed that the energy cooperation between China and the Arab states would promote direct investment and trade between the two sides, such as finance, manufacturing, agriculture and tourism and other mutual benefit cooperation. To sum up, in my understanding, the feasible and enduring national interests, along with the mutual complementarity and mutual needs of economic development will become the major driving force for energy cooperation between China and Arab states in the 21st century.

2.4 The Belt and Road Initiative Provides a New Opportunity for Energy Cooperation between China and Arab states

On March 28, 2015, with the authorization of the State Council, China's National Development and Reform Commission, the Ministry of Foreign Affairs and the Ministry of Commerce jointly issued the "Vision and Actions on jointly Building Silk Road Economic Belt and the 21st-Century Maritime Silk Road"[32]. So far B&R has become the key word for China's grand strategy for diplomacy in 2015, in advancing this initiative, the Chinese government comprehensively pushed forward this strategy from the aspects of economy, politics, society and culture. The "keeping-low-profile" Chinese foreign policy for many years has been gradually altering.

As Arab countries are located in the convergence zone of Asia, Europe and Africa, they have geographical advantages and will be main beneficiary countries during the implementation of the B&R initiative. China has mainly played economic cards towards Arab countries and emphasized the establishment of infrastructure such as roads, airports and ports, as well as the interconnection and interoperability of various oil and gas pipelines and power grids, in order to strengthen the alliance with Arab countries in the field of energy exchanges and cooperation. Meanwhile, the Arab states have given positive responses towards this strategy. For instance, Kuwait is planning a $130 billion project to build a new city in the coastal region of Sofia in northern Kuwait. Once completed in 2035, it will become an important strategic hub of the Silk Road connecting China and Europe.[33] Qatar hopes that China could actively participate in the construction of its own railways and ports and then pave the way for the smooth implementation of whole B&R strategy. Turkey and China have reached cooperation in fields such as aerospace, finance, investment and high-speed rail, to push forward the process of the B&R strategy. The smooth implementation of B&R initiative undoubtedly brought unprecedented opportunities for energy cooperation between two sides.

Chapter III: SWOT analysis on Energy Cooperation between Chinese Energy Enterprises and the Arab states

SWOT analysis, known as the four English letters represent: Strength, Weakness, Opportunity, Threat, which S&W are mainly used to analyze the internal environment; O&T are used to describe the external environment.

In this chapter I will choose Sudan and Saudi Arabia as two case studies to describe energy cooperation between China's energy companies and Arab countries. By using the SWOT method, I will specifically explain the favorable and unfavorable factors existing in the process of CNPC's energy cooperation in Sudan and Sinopec's in Saudi Arabia, as well as the opportunities and challenges, providing references for China to further expand its energy cooperation with the Arab states.

3.1 Energy Cooperation between China and Sudan

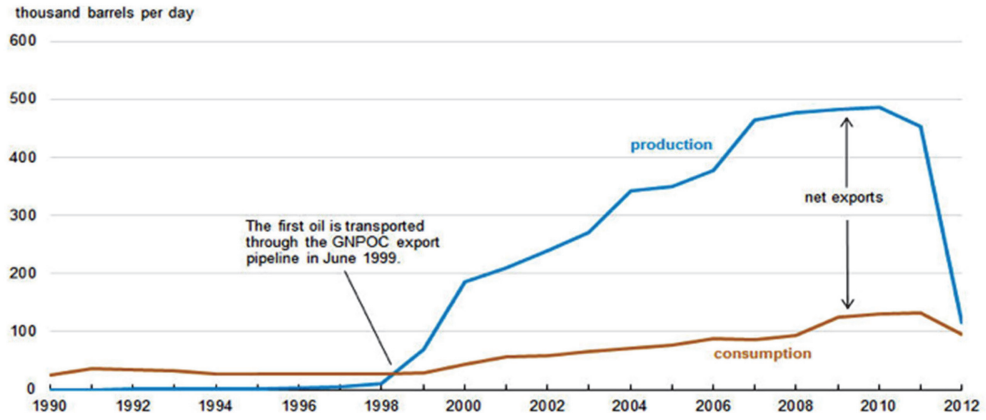
1. Sudan at A Glance

Sudan, located in the transition zone between West Asia and North Africa, is an extremely significant international strategic channel. It is an important gateway from North Africa to the hinterland of Africa, a traffic hub from the Red Sea to the middle of Africa and from the Mediterranean to the Indian Ocean as well. (**Figure 7**) As World Bank described, the country has been beset by conflict for most of its independent history.[34] Until 2011, the southern part of Sudan seceded and formed the Republic of South Sudan under the terms of a peace agreement in 2005.[35]

In the 1990s, oil fields with abundant reserves were found in Sudan. According to BP Statistical Review of World Energy 2016, the proved oil reserves of Sudan rose from 0.3 thousand million barrels in 1995 to 0.6 thousand million barrels in 2005 to 1.5 thousand million barrels in 2015. With the growing oil reserves and increasing oil production (respectively 9000 bb/d in 1997, 294000 bb/d in 2005 and 475000 bb/d in 2009[36]), Sudan's status in oil-exporting countries has gradually risen. Prior to the split, the unified Sudan was the second-largest oil producer in Africa in 2010, outside of the Organization of the Petroleum Exporting

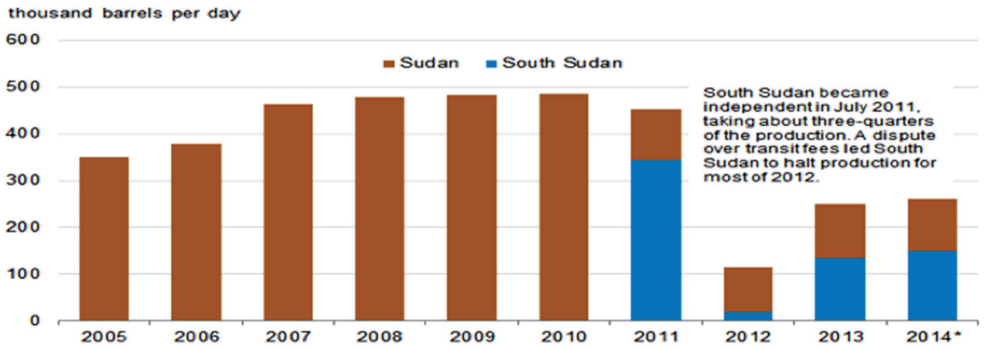
Source: africaguide.com

Figure 7. The Map of Sudan and South Sudan



Source: U.S. Energy Information Administration

Figure 8. Crude Oil Production (including lease condensate) and Consumption in Sudan and South Sudan, 1990-2012



Note: 2014 is January to June
Source: U.S. Energy Information Administration

Figure 9. Oil Production in Sudan and South Sudan

Countries (OPEC).[37] However, about three-fourths of the oil production was gained by South Sudan since the split in 2011. At present, although Sudan and South Sudan's oil sectors are closely linked, disagreements over oil revenue sharing and armed conflicts still frequently occurred in both countries, the total production of oil has dramatically declined (see two figures from EIA below), which led to the huge loss of Sudan's economy.[38]

2. Profile about China-Sudan Energy Cooperation

China and Sudan have established diplomatic relations as early as 1959. However, until the mid-1990s, two countries just maintained a stable bilateral political relationship, while cooperation in other areas were very limited. Until 1995, a production-sharing contract (PSC) signed by China National Petroleum Corporation (CNPC) and

the Sudanese Ministry of Energy and Mineral Resources for Block 6 in the Muglad basin.[39] So to speak, oil as a key medium, began to closely linked two distant countries and greatly promoted the process of exchange between two countries. Since then, China and Sudan oil cooperation has kicked off; Chinese enterprises have started large-scale investment in Sudan oil industry. As Sudan's top oil exporter, oil cooperation between two countries developed rapidly. Over the past two decades, the outcome of China-Sudan energy cooperation has been reflected in the Sudan economy and all aspects of people's lives.

First of all, the Sudanese oil industry has formed a complete system. China National Petroleum Corporation (CNPC) had upstream investment projects in five major oil fields: Blocks 1/2/4, Blocks 3/7, Block 6, Block 13 and Block 15 oil fields[40] and put into operation, its output accounted for the majority of daily crude oil production (50 million barrels). Simultaneously, China-Sudan jointly construction of Khartoum Refinery, with an annual crude processing capacity of 2.5 million tons,[41] which not only solved the Sudan's domestic demand for gasoline and other refined oil, but also helped export some refined oil. In addition, China has helped Sudan to build oil pipeline and other oil industry facilities, such as crude oil pipelines of Blocks 1/2/4 to Red Sea, of Blocks 3/7 to Port Sudan, and Block 6 to Khartoum refinery, were also constructed by CNPC.

Second, the cooperation between China and Sudan has further developed from oil projects to a large number of engineering contracting projects, which has achieved positive results.[42] One example is the El Gaili Power Station project that Harbin Power Engineering Company Limited built in Sudan; it served to solve the power shortage problem that troubled Sudan for many years and benefited to the livelihood of people.[43] The local people even sincerely called the Chinese and Sudanese workers who participated in this project the "bringers of Light".[44]

Third, China-Sudan energy cooperation has greatly increased the local employment opportunities, including more than 10 million direct employees. All the ongoing CNPC projects in Sudan employed large numbers of local Sudanese employees, and over 90% of the staff were local Sudanese in some projects, according to Zhu Junfeng, head of the CNPC Coordination and Leading Group for Sudan Projects and general manager of CNPC International (Nile) Limited.[45]

Fourth, while helping Sudan to develop energy and mining, China also helped train local Sudanese employees, which not only satisfied the demand of skilled manpower for these projects, but also produced a large number of operatives and managerial talents for Sudan's oil industry.[46] In addition, Chinese companies constructed roads, hospitals and water supply and other supporting facilities, which improved the local residents' living environment significantly. In sum, CNPC's energy investment in Sudan was its largest investment project overseas, and the first upstream and downstream integration project as well. The energy cooperation between two sides brought tangible economic benefits, but also made outstanding contributions to the world's energy security.

Sino-Sudan energy cooperation can be regarded as the most successful case in the history of China's energy diplomacy, which is also the main reason I chose Sudan as one of cases. Nowadays, Sudan has also been one of crucial participants in China's Belt and Road initiative and has benefited from China's active

investment in many projects ranging from infrastructure to education. After the general overview, I will use SWOT method to analyze the advantages and disadvantages of future energy cooperation between the two countries.

3.1.1 Analysis of Strengths of Internal Environment

(1) CNPC's Advanced Technical Conditions Had a Great appeal to Sudan

CNPC had a wealth of experience and advanced exploration technology in the energy operations, which was also a major factor contributing to the energy cooperation between CNPC and Sudan. Since the geological conditions of Sudanese oil area were similar to that of Bohai Bay basin in China, and coincidentally Chinese side had mature experiences and techniques in exploration and development of such fields, which made the energy cooperation between CNPC and Sudan even more powerful and reliable. Hence, on September 26, 1995, CNPC and Sudan Ministry of Energy and Mines reached a consensus jointly signed a Production Sharing Agreement about Block 6 oilfield of the Muglad Basin in Darfur, located in southern part of Sudan. As the earliest wholly-owned project of CNPC in Sudan, by the end of 2004, CNPC achieved 210 million barrels of accumulated recoverable reserves and over 1 billion barrels of proven geological reserves in Block 6.[47)]

In November 1996, CNPC won the right to exploit the oil block 1/2/4 of the Muglad Basin. CNPC adopted a series of mature domestic technologies to effectively increase the production capacity of the oilfield. The annual production capacity of Block 1/2/4 was increased to 10 Mt within eighteen months.[48)] Besides, applying its technical strength, CNPC discovered Palogue, a world-class oil field in the Meluft Basin in Block 3/7 of in 2003, followed by the 100 Mt Moleeta Oilfield and several smaller oilfields of around 10 Mt.[49)] Another successful example is Khartoum Refinery, the largest refinery in Sudan, which jointly operated by CNPC and the Sudan Ministry of Energy and Mining. Complying with Chinese national standards, KRC adopted state-of-the–art technology, and the output of the refinery jumped up to 5 million t/a until 2006 by using overall oil-processing techniques, advanced inventions and materials.[50)]

(2) The Government Support Provided the Strong Guarantees for Energy Cooperation between Two Sides

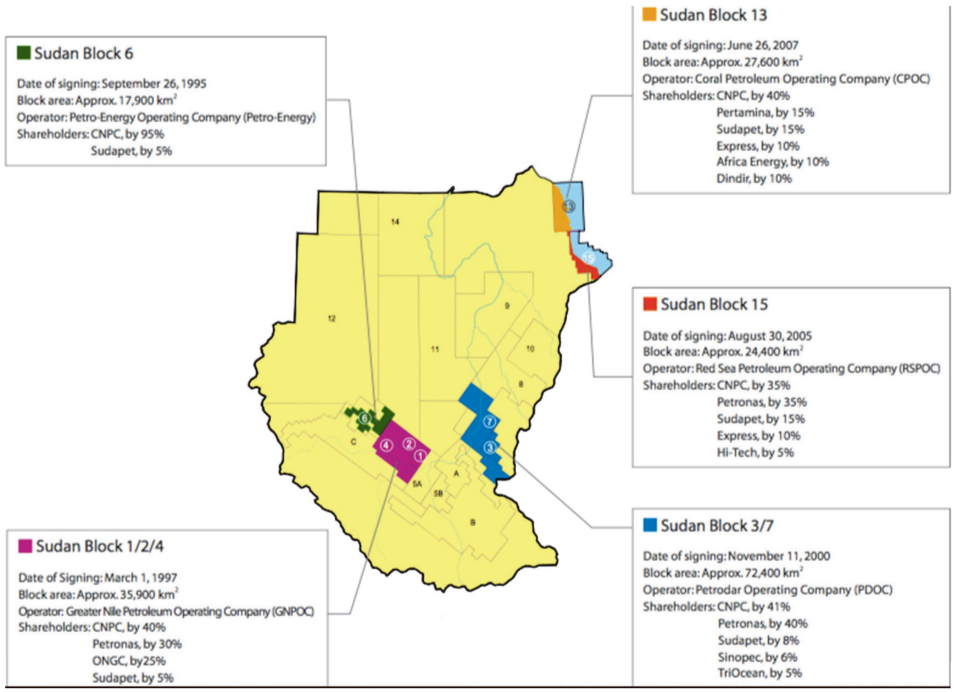
Government support for energy cooperation is mainly reflected in the two aspects: financial assistance and policy support. In terms of financial support, China Development Bank (CBD) and the China Export-Import Bank (Exim) played leading role, which were established in 1994.[51)] For example, CNPC's acquisition of Sudanese oil fields (Block 6) was initially met with disapproval and only after intense lobbying did the China Exim Bank provided CNPC the aid to pursue the project.[52)] And in Block 3/7 project, CNPC also obtained 400 million Yuan loan support from former Ministry of Foreign Trade and Economic Cooperation.[53)]

With regard to policy support, the government support national oil companies through diplomatic channels can be defined as "petroleum diplomacy". The increasing attention given in Sudan evidenced by the increasing number of high-level visits to Sudan. For example, from 1959 to 1999, Chinese top leaders merely visited Sudan six times during four decades. While from 2000 and 2009, five times official visit and four of them were arranged to visit CNPC's projects, which implied that

two governments showed great concern and increasingly played the "escort" role in bilateral energy cooperation. Moreover, the Chinese government has strengthened its political relations with Sudan by reinforcing high-level meetings on various multilateral occasions, promoting the China-Sudan joint ministerial committee mechanism and promoting inter-party exchanges and military cooperation.

(3) CNPC's Joint Venture Mode Has Promoted the Energy Cooperation Process

Among all projects CNPC invested in Sudan, only the Block 6 project and the construction of petrochemical plant were solely owned by CNPC. Others have adopted a joint venture model consisting of CNPC with the Sudanese government and various shareholders. This model could not only effectively spread the risk, but also help to form the scale effect, making the pie bigger. (The figure below provides an overview of the joint venture model used by CNPC in its Sudanese oil investment projects.) What's more, "under this model, the Chinese Government and enterprises provided capital, technology, and equipment for Sudan, but also attached great importance to Sudan's human resources development," Awad Ahmed Al-Jaz, Sudanese Minister of Energy and Mining, once told the reporter of Chinese News Agency Xinhua.[54)]



Source: CNPC in Sudan—Review of 15 years of Sino-Sudanese petroleum cooperation, p6. Available at http://petrochinaintl.com.cn/csr/xhtml/PageAssets/CNPC%20in%20Sudan.pdf

Figure 10. CNPC's projects in Sudan

3.1.2 Analysis of Weaknesses of Internal Environment

(1) Dispute over the Redistribution of Oil Interests after the Separation of North and South Sudan

South Sudan possessed about 75 percent of the oil production when it became independent in July 2011. According to the US Energy Information Administration (EIA) there are three refineries located in Sudan; Khartoum, Port Sudan and El-Obeid with total refinery capacity just less than 122,000 bpd.[55] Although most of the oil production capacity is now in South Sudan, South Sudan remains dependent on North Sudan to use its refinery, export pipelines and port,[56] thereby the heart of the dispute is that South Sudan must pay Sudan transit fees in order to transport South Sudan's oil from the oil fields located in South Sudan to the sea ports in Sudan.[57] This led to a big divergence over the distribution of oil interests between two sides: South Sudan needed to rely on North Sudan's transport facilities and desired more income distribution, while North Sudan expected to control the southern oil revenues under the central government. As a result, due to the unresolved issue of the redistribution of oil interests, the two sides have been continuously conflicting and contradictory for many years. In January 2012, because of the disagreement over the distribution of petroleum interests between North and South Sudan, South Sudan announced that the oilfields in Block 1/2/4 and Block 3/7 have all been shut down,[58] which has seriously affected China's oil interests in Sudan. Until April 2013, South Sudan started to resume production due to the active promotion of the international community and the Chinese government. So to speak, if the redistribution of oil interests between north and south Sudan cannot be properly handled, it would become the biggest stumbling block in the future bilateral energy cooperation.

(2) The Issue of Border Security has been Another Major Hidden Danger during the Energy Cooperation

North and South Sudan have yet to reach a final agreement on the issue of border demarcation. The issue of attribution of Abyei region has been seen as a potential "gunpowder" for the conflicts between North and South. This fertile land is located in the North-South border and possesses rich underground petroleum reserves, which has been an important oil-producing area. And one of important Sudanese oil pipeline, the Great Nile, passed through the Heglig oil field in this region directly to the Red Sea port. In order to compete for oil interests, many conflicts broke out between North and South, so that tension has been mounting in this region.

In addition, after the split between South and North Sudan, there were still some differences in religion, ethnicity, culture and politics, two sides continued to encounter contradictions and disputes. Most of northern people were Sunnis, while the south dominated by tribal people. The frequent clashes affected people's lives and property safety, the cases of attack, kidnapping and robbery of the employees of Chinese oil companies sporadically occurred. This has seriously influenced China's oil security in the region and has to a certain extent restricted the process of oil exploration by Chinese energy companies in this area.

3.1.3 Analysis of Opportunities of External Environment

Since the United States imposed sanctions on Sudan in 1997,[59] the United States and other major Western powers have withdrawn from the

Sudan oil market, which has given tremendous space for advancing the investment of Chinese oil and gas companies in Sudan. Seeing that South Sudan split from Sudan, the United States might return to South Sudan oil market. However, based on the current situation, first, the exploration range in South Sudan was rather small, United States large-scale return still lacks substantial motivation; second, North and South Sudan had a strong wish to strengthen mutually beneficial cooperation, whereas the United States won't be willing to share a piece of cake with North Sudan, thus it might not open oil and gas resources to South Sudan in the short term. In view of this, on the one hand, the threats from the United States would not be large, and other Western developed countries still took a wait-and-see attitude and were more cautious about oil and gas investments in Sudan. On the other hand, China has kept maintaining close contact with South Sudan, not only providing financial support in various fields but also rich experience and technical assistance in oil exploration in South Sudan. Therefore, the prospect of energy cooperation between China and Sudan would be very promising.

3.1.4 Analysis of Threats of External Environment

(1) Respond to the Challenge of Resource Nationalism Wave

One Economics professor Geoff Riley pointed out those have natural endowments such as minerals and other commodities have been continually assessing how they can acquire more revenue by various means, such as taxes, royalties or full-scale state-ownership from these resources while it might inhibit foreign direct investment (FDI) and affect existing operation.[60] Indeed, with the increasing importance of African petroleum resources in the global energy landscape, there was a trend of rising resource nationalism in African oil-producing countries.

In the new wave of resource nationalism from 2003 to 2008, various energy-producing countries in Africa experienced threats of tax increase to varying degrees (such as Ghana and Sierra Leone) and renegotiation of condition (such as the new regulation of oil companies in Nigeria, Libya and Algeria), the expansion of participation and nationalization of state-owned companies (such as Namibia), especially in the oil and gas industry. Although following the global financial crisis in 2008, with the sharp drop in international oil prices, the momentum of resource nationalism in Africa has been suppressed. However, South Sudan, which has just been independent, facing of severe domestic economic problems, might still be able to boost its energy revenue by resource-nationalist approach such as renegotiating oil contracts with foreign oil companies or increasing oil revenues.[61]

3.2 Energy Cooperation between China and Saudi Arabia

1. Saudi Arabia at A Glance

Saudi Arabia was established in 1932 by King Abd-al-Aziz and it has been a main player located in Arabian Peninsula. Although most of Saudi land consists of inhospitable deserts and barren wilderness, it became one of the wealthiest countries in the Arab region. It is the only country that has both the Red Sea and Persian Gulf coastlines (see the map below). As BBC news described, the stature of Saudi Arabia is built on its geographical size (twice that of France and Germany combined), its prestige as the custodian of the birthplace of Islam and its colossus status as an oil producer.[62]

Saudi Arabia is known as the "oil kingdom".

Source: https://geology.com/world/saudi-arabia-satellite-image.shtml

Figure 11. The Map of Saudi Arabia

According to the data from OPEC Annual statistical bulletin 2017, its proven crude oil reserves are 266.2 billion barrels at the end of 2016[63] and the daily crude oil production capacity reaches 10.5 million barrels possessing around 22% of the world's proven petroleum reserves and ranks as the largest exporter of petroleum.[64] Except the vast oil resources, Saudi Arabia's remaining recoverable reserves of natural gas is 8.2 trillion cubic meters, accounting for 4.1% of the world's reserves, ranking fourth in the world. The oil and gas sector contributes about 50% of gross domestic product (GDP), and about 85% of export earnings to Saudi Arabia.[65] As a number of WTO, OPEC, the GCC and G20, Saudi Arabia has been playing a decisive role in the political, economic, and religious fields in the Arab region and even in the world.

2. Profile about China-Saudi Arabia Energy Cooperation

The researcher Naser Al-Tamimi[66] once wrote this in his book:

China and Saudi Arabia moved to an advanced stage when the diplomatic relations was officially established in July 1990. And the bilateral links grow rapidly and further expanded in the following decades. The economic cooperation in petrochemical sector is a case in point. (Al-Tamimi, 2014)

Therefore, during the visit of the then-President Jiang Zemin to Saudi Arabia in 1999, the two sides have established a strategic petroleum partnership and signed an oil cooperation agreement. The agreement stipulated that Saudi Arabia would open its domestic oil and gas market to China and allow Chinese companies to enter the oil exploration and production field. China has also agreed to open the domestic oil processing and consumption market to Saudi investors,

which has created favorable conditions for the economic, trade and energy cooperation between the two countries. As a result, China Petroleum and Chemical Corporation (Sinopec) and Saudi Aramco have collaborated on downstream projects in China, joining forces to build a refinery in Qingdao in eastern Shandong province and to expand a petrochemical facility in Quanzhou in the province of Fujian.[67] The joint venture has expanded China's refining scale and raised China's refining level.

In the 21st century, with the continuous development of economic globalization, China and Saudi Arabia have become increasingly important in the world energy market. By April 2006, then-President Hu Jintao paid a state visit to Saudi Arabia. The energy issue was naturally one of important agendas for Beijing and Riyadh. The two sides signed a series of cooperation agreements, one of which was the energy framework cooperation agreement between Sinopec and the Saudi's national petroleum company that the two sides promised to strengthen cooperation in joint exploitation of oil, natural gas and mineral. By the time Wenchuan earthquake occurred in China in 2008, Saudi Arabia donated US$60 million to Chinese government. One month after that, the Chinese vice president visited Saudi Arabia and the two sides signed the joint statement of PRC along with Saudi Arabia on strengthening cooperation and strategic and friendly relations.[68] During the visit of the President Xi Jinping to Saudi Arabia in 2016, the two countries issued the Joint Statement Between the People's Republic of China and the Kingdom of Saudi Arabia on the Establishment of Comprehensive Strategic Partnership,[69] further signed the Belt and Road cooperation intergovernmental documents, and decided to establish a high-level joint commission of the two countries.

Indeed, the frequent head-of-state exchanges promoted closer Sino-Saudi political relations, which led to greater economic cooperation in terms of energy and trade. Saudi-Chinese trade has exploded from around US$1 billion in 1990 to more than US$70 billion by 2013, surpassing Saudi-U.S. bilateral trade in the process.[70] Also, China's imports of energy from Saudi Arabia further increased year by year. Among them, the growth of crude oil imports was the most representative. From 2002 to 2010, the total crude oil exported from Saudi Arabia to China increased from 11.93 million tons to 44.63 million tons. During the eight years, the average annual growth rate of Saudi crude oil exports to China reached 18.61%. The customs data also showed that Saudi Arabia ranked first in the source country of China's crude oil imports in 2015, with an import share of approximately 15.1%.[71] The energy cooperation between the two countries continues to heat up, and more attention has been paid to large-scale energy projects.

As the Chinese ex-ambassador to Saudi Arabia, Song Wei said, there are two key words as far as ties between China and Saudi Arabia is concerned, they are "energy cooperation".[72] Indeed, although China-Saudi energy cooperation started late, its development demonstrated a sound momentum of growth. Saudi Arabia has a wealth of energy reserves and energy development prospects, while China can provide a large and stable consumer market and talent technical cooperation resources for Saudi Arabia's foreign energy trade. In my understanding, the relations between China and Saudi Arabia led by energy cooperation, driven by economic interests, while with the changing pattern of global governance, the bilateral cooperation already develop beyond oil to multi-

level cooperation, which is mutually beneficial to their strategic demands and national security.

3.2.1 Analysis of Strengths of Internal Environment

(1) Long-term Friendly Cooperative Relations between Sinopec and Saudi Arabia

Saudi Arabia, with its abundant oil resources, has been the world's largest supplier of crude oil, which occupied a decisive position in global energy production and supply market. Since the establishment of diplomatic relations between China and Saudi Arabia in 1990, China has placed more emphasis on developing energy cooperation with Saudi Arabia. As a result, mutual cooperation and investment in the energy sector started, both sides have gradually developed their energy strategic partnership. In 2002, Saudi Arabia became China's largest crude oil supplier. Three years later, Sinopec, together with Saudi Aramco and U.S. Exxon Mobil, jointly invested 3.5 billion dollars to build Fujian integrated refining project. Aramco and Exxon each have 25 percent of the refinery and petrochemical joint venture, and the Fujian Petrochemical Company Limited (FPCL) holds the remaining 50 percent.[73] After the project was completed in 2007, the three companies formed a joint venture with a refined oil sales company, which eventually brought the total investment to US$ 5 billion.

In addition, Sinopec and Saudi Aramco have had a gentlemen's agreement that Saudi Arabia guaranteed that China could obtain crude oil from Saudi Arabia at any time. Saudi Arabia has been fulfilling its commitments and it has maintained China's No.1 crude oil supplier for many years. Although Russia overtook Saudi Arabia in 2016 as China's biggest crude oil supplier,[74] Saudi is remaining among the top three suppliers. Moreover, on January 14, 2012, Sinopec and Aramco jointly established the Yanbu Aramco Sinopec Refining Company (YASREF) oil refinery in Yanbu Industrial City of western Saudi Arabia, which was Sinopec's first overseas refinery, and Sinopec's largest investment project in Saudi Arabia as well.[75] The leaders of two countries attached great importance to it, President Xi Jinping and Saudi King Salman together attended the launching ceremony on January 20, 2016. And Xi pointed out the YASREF is not only in line with Saudi Arabia's national development strategy of optimizing and upgrading economy and energy industry, but also fits with China's development thoughts of conducting mutually beneficial cooperation under the framework of the Belt and Road.[76] In fact, not only oil industry, Sinopec had also obtained opportunities for the development of natural gas in Saudi Arabia, initially investing US$300 million to develop the Saudi Gas Initiative 2(SGI2) natural gas project and signed a contract for exploration and development. As Saudi Aramco's former CEO Khalid A. Al-Falih said, some observers, especially who outside of China and Saudi Arabia superficially see the relationship with China as a one-way flow of oil from Saudi's company to China. However, in fact, on the other side, Saudi Arabia also relies on China as a consumer as much as China looks to it as a producer.[77] China's vast energy market is also important for Saudi's energy security. Therefore, the long-term friendly and stable cooperation relationship between China and Saudi Arabia laid the solid foundation for the greater development of both parties in the future.

(2) The Strong Complementarity in Petroleum Policy of China and Saudi Arabia

On the one hand, as a country with a high reserve-production ratio,[78] Saudi Arabia

pursed medium-long term interests and strove to use long-term, moderate methods to extract oil and obtain stable oil revenues. Thus the basic objectives of Saudi's external oil policy are to stabilize oil prices and develop powerful and competitive oil industries with high levels of integration at home and abroad in order to ensure stable fiscal revenues. It has been pursing prudent oil policy and actively seeking cooperation with oil consuming countries to reduce oil price fluctuations and mitigate risks, which was mainly implemented through two levels: national and international organizations. At the national level, Saudi Arabia's oil diplomacy can be described as oil-for-security, that is, Saudi Arabia kept cheap oil flowing to the United States and the United States helped maintain Saudi security by committing military resources to the defense of the nation.[79] At the level of international organization, in the 1960s, Saudi Arabia, allied with Venezuela and other countries, formed Organization of Petroleum Export Countries (OPEC)[80] to achieve the goal of keeping oil price stable, reducing oil price volatility and adjusting world oil supply.[81] Saudi Arabia has played a pivotal role in the major strategic changes in OPEC's oil policy.

Saudi Arabia considers China as the world's largest oil market and an indispensable partner in the future. As one senior executive of Saudi Aramco explained, "We need the Chinese market and we are going to get it just as we got Japan and the Untied States-through aggressive marketing subsidies."[82] Thus, in order to gain market share in China, Saudi Arabia provided China with some benefits, including below-market oil prices and access to Saudi's higher-quality, low-sulfur crude oil, even take precedence over existing European and American customers.[83]

On the other hand, China's cooperation with Saudi Arabia is not only driven by economic interests but also based on strategic considerations. The Middle East has always been the traditional sphere of influence of the United States. Although the region is the main source of Chinese oil imports and China invested a lot in this land, China's influence in the region is still relatively limited and these investments are not enough to guarantee China's energy security. China also worries that Sino-American tension or disruption of oil supply would lead to United States blockade of China's access to Middle East oil. The history that U.S. inclined to staunch the flow of oil during the embargo of Saddam Hussein's oil exports from Iraq and the tacit threats to block China's oil import during a conflict over Taiwan has caused China's bigger fear.[84] Thus, in my understanding, the complementarity in petroleum policy and strategic demands would contribute to the deeper and more comprehensive cooperation between China and Saudi Arabia.

3.2.2 Analysis of Weaknesses of Internal Environment

Although China has become the world's largest energy consumer and net oil importer, its lack of oil pricing power and discourse power is also an indisputable fact, which has made China's energy companies were in the passive position on crude oil imports. At present, the total oil consumption in North America and Europe has been gradually declining, The Asia-Pacific region has surpassed America and Europe in oil consumption, but the WTI[85] and Brent crude oil price[86] still dominate the global crude oil futures exchange price, a benchmark with high recognition in Asia-pacific region is absent. As a result, Asian countries pay more than Europe and America for imported oil. It is an additional $2 billion a year in the case of

China.[87] What's more, the prices of European and American exchanges have been difficult to reflect the supply and demand conditions in the Asian oil and gas markets. For the Chinese market, sometimes the domestic market has been oversupplied, while the oil price has to be raised. During the time of domestic supply was insufficient, while the oil price was lowered. This affected the normal production, consumption and brought incalculable losses to consumers and oil companies. At the same time, the lack of oil pricing power and discourse power also had negative impacts on China's foreign energy cooperation. Being forced to accept high oil prices that do not reflect real energy demand led to constant frictions in bilateral energy trade and imbalances in international payments. In 2018, China launched crude oil futures on March 26, which can better reflect the condition in Asia, however analysts pointed out that it could take time before China's new oil futures challenge the dominance in oil trading of the two current global benchmarks.[88]

Furthermore, even though both China and Saudi Arabia want to maintain the stability of global oil market, it does not mean that both sides hold the same view of "what kind of oil price is reasonable". As a big oil importer, China's priority is to ensure the reliable supply of oil, followed by the pursuit of cheaper prices as much as possible. China against uncontrolled high oil prices, as it will cause inflation and hinder its domestic economic growth. Saudi Arabia, on the other hand, has sought to avoid a sustained downturn in oil price because Saudi's population has soared and it needs to provide a large amount of work, water, electricity, education and medical facilities, while its fiscal deficit is huge. As an executive from Unipec, the trading arm of China's Sinopec, told Reuters, Sinopec plans to cut its crude imports from Saudi Arabia by 40% in June and July because of "unjustified" high official selling prices (OSP) of Arab Light.[89] If this situation couldn't be solved, the divergences between the two nations in oil prices would cast a shadow over the bilateral energy cooperation in the future.

3.2.3 Analysis of Opportunities of External Environment

Li Chengwen, the Chinese ambassador to Saudi Arabia once said that the Belt and Road initiative is a rare opportunity for the development of China-Saudi Arabia relations. Two thousand years ago, Chinese Ming Dynasty Muslim navigator Zheng He led the fleet to visit Saudi Arabia, the ancient Silk Road has linked those two distant countries. Under the new situation of building the Belt and Road initiative, Saudi Arabia is at the hub of the B&R initiative and has enthusiastically supported the Chinese initiative. In 2015, Saudi Arabia joined the AIIB and invested 20 billion U.S. dollars as start-up capital, hoping to attract Chinese investment. Subsequently, from January 6 to 8, 2016, during the visit to Saudi Arabia by Vice Foreign Minister Zhang Ming, Saudi Arabia responded positively to the B&R strategy and expressed its willingness to become China's faithful partner to work together with China on the construction of energy, trade, and infrastructure.

Moreover, China's Belt and Road initiative shares many similarities with Saudi's Vision 2030. In 2017, Saudi King Salman visited Beijing, he signed a commercial agreement worth about US$65 billion and promised to work with China to promote Saudi Arabia's Vision 2030 aiming to diversify Saudi Arabia's economy and the Belt and Road initiatives. Indeed, Saudi Arabia has played a prominent role in the construction of the Belt and Road initiative, especially in the energy sector. For example, Saudi Aramco's

refining-chemical integration project in Fujian, China, has been serving the petrochemical market in China since it was put into operation, and continued to seek more investment opportunities in southwestern China market. Saudi Aramco was also willing to provide necessary support for China's establishment of strategic oil reserves and development of oil reserve facilities.

Furthermore, regarding to the construction of roads, railways, oil and gas pipelines and other infrastructures, Saudi Aramco utilized its technical advantages in oil and gas pipelines and management experience, helping China build oil and gas pipeline facilities that link coastal and inland areas to meet China's long-term energy needs. At the same time, Saudi Arabia's oil pipeline infrastructure projects are opening the door for more and more Chinese construction companies. Therefore, the docking of China's B&R initiative and the Saudi Vision 2030 would provide an opportunity for promoting bilateral energy cooperation to an advance level.

3.2.4 Analysis of Threats of External Environment

Energy is not only an important driving force for promoting the development of one country's economic status, but also a strategic resource for ensuring one country's discourse power in world politics. Saudi Arabia is known as its abundant energy storage capacity. As early as the last century, the United States, Britain, France, Russia and other major countries have engaged in a series of competitions over the oil exploration and exploitation rights in the Saudi region, which formed a situation that Saudi Arabia's energy resources were divided up by Western powers in the end. For China, who has entered the Saudi Arabia's energy cooperation market relatively late and lacked mature core technology, it undoubtedly increased more challenges and potential threats.

What's more, the U.S.-led Western powers attempted to implement Western-style democracy and reform movements in the Middle East region. To achieve this goal, the U.S. Bush administration has specifically unveiled the "Greater Middle East Initiative" in 2004 -a strategy aimed at exporting the American democratic model to the Arab-Islamic world and redefining borders and nations in tune with America's geopolitical ambitions.[90] The famous "Arab Spring" movement led by the U.S. and other Western powers has resulted in the tumult of regime changes in the Middle East and west Africa, causing the local people suffered in the fiery war. In addition to the more moderate democratic revolutionary movement that has caused political instability in the Arab world, the Western powers headed by the U.S. have also triggered many brutal wars in this region. Among them, the U.S. had occupied Iraq, a major energy exporting country, and the Iraqi people still lived in the flames of war; the U.S.-led Afghanistan war not only plunged the U.S. itself into the quagmire, but also bred the rampant terrorism; the U.S. and other Western powers continued to provide arms, capital, and information support for aggravating the five Middle East wars, the Yemen conflict, and the Syrian conflict.

The increasingly close oil cooperation between China and Saudi Arabia will inevitably arouse the attention of the United States. As early as before the 9/11 incident, American scholars have already showed worries, such as: China's desire for oil might lead to "the worst nightmare in the West: the combination of Islam and Confucianism",[91] and "the alignments between Islamic and Sinic civilizations would intensify the world conflict".[92] Despite the fact that the relationship between the United States

and Saudi Arabia once fell into a depression after the September 11 attacks, the relations of oil-for-safety between them still exists. Indeed, the U.S. has reduced its reliance on military bases in Saudi Arabia and the U.S. energy giant also intended to reduce its share of oil imports from Saudi Arabia. However, the close relations between Saudi Arabia and the U.S. have already gone beyond oil and the U.S. will not allow China to fill its own vacuum of interests. Therefore, the game led by the U.S. in Saudi Arabia would have directly or indirectly impacts on the external political environment during the process of energy cooperation and limit the scope and depth of future energy cooperation between China and Saudi Arabia.

Chapter IV: Prospects of the China-Arab states Energy Cooperation

To summarize, the findings of this thesis are reflected in the following aspects:

First, energy relations between China and Arab countries are highly interdependent: China needs the continuous and large-scale of oil and natural gas which import from Arab countries, while Arab countries are relying on China as a huge consumption market. The energy cooperation between China and the Arab states is mainly led by the government and high-level exchanges, and they adopt long-term intergovernmental agreements.

Second, energy trade and investment are the primary forms of China-Arab energy cooperation: Chinese NOCs invest in the oil and gas resources of some Arab countries, providing technical services for Arab countries and investing in oil and gas exploration, oilfield services, and infrastructure construction, while some Arab countries invest in China's downstream oil and gas markets as well. However, Chinese companies have so far been unable to obtain a significant share of oil and gas production investment opportunities in some countries. Chinese NOCs' foreign oil and gas cooperation project are mostly concentrated in overseas mergers and acquisitions or equity participation of some small-medium-sized or marginal oil and gas fields, thus acquired controlling rights and actual resources are very limited, and the scope and depth of China-Arab energy cooperation are still insufficient.

Third, China's energy diplomacy is more of a top-down form. That is, the Chinese government plays a major role in foreign affairs, and non-governmental actors are less involved. In my opinion, the successful cooperation experience between CNPC and Sudan has demonstrated that energy enterprises, not only national companies, should be encouraged to act firstly to carry out cooperation in the further cooperation, while the government should play the guiding and escorting role.

Fourth, China-Arab energy cooperation is mostly oil-centered cooperation. However, after entering the 1990s, the concept of sustainable development has been increasingly introduced into the energy development strategies of various countries. In responding to climate change issues and reducing excessive dependence on fossil energy, the concept that promotes the development of low-carbon economy and the development of alternative energy is increasingly accepted by the international community. Therefore, the Sino-Arab cooperation in clean energy and new energy sector apparently has greater development prospects.

Last but not least, the Arab countries have played a crucial role in the smooth process of China's Belt and Road initiative. The Arab League includes 22 countries, and each country has its own political and economic situation.

Facing the countries with backward economic development and political turmoil represented by the Sudan or the countries with relatively stable economic development and political situation such as Saudi Arabia, China should have different focuses and varying degrees of risk considerations during the cooperation with each of them.

The prospect section of this thesis aims at providing some policy recommendations on strengthening and deepening the energy cooperation relationship between China and the Arab states. To be specific, I would put forward some suggestions from five aspects: policy coordination, facilities connectivity, unimpeded trade, financial integration and people-to-people bonds,[93] which are on basis of five priorities of the Belt and Road initiative and China's Arab Policy Paper.

4.1 Strengthen Policy Coordination to Promote the Development of Cooperation Mechanisms between China and Arab countries

4.1.1 Give Full Play to the Official Platform Effect and Improve the Functions of Various Cooperation Mechanisms

Up to now, various cooperative activities organized by China and Arab states under the framework of the China-Arab States Cooperation Forum have made remarkable achievements in the field of energy, economy, personnel exchanges, environmental protection and tourism. Therefore, to further improve the cooperation mechanism and exert the official platform effect between China and Arab states, two sides should continue to maintain the role of "Forum" and its main mechanisms, such as Ministerial Conference, Senior Official Committee Meeting, China-Arab Business Conference, Liaison Group and other existing cooperation mechanisms in the process of the Belt and Road initiative, helping make decisions and monitor their implementation.[94]

Furthermore, paying attention to nurturing the functions of the China-Arab Cooperation Energy Conference, so that it can play a leading role in facilitating and accelerating the establishment of the more comprehensive energy cooperation framework, thereby helping to launch mutual beneficial energy cooperation between China and Arab countries. Besides, in the implementation of the B&R strategy, through policy communication, China could actively seize the opportunity that Arab oil-producing countries establish large-scale oil refineries in China to promote China and Arab countries to form closer strategic cooperation relations.

4.1.2 Consolidate Various Communication Channels

Since the main body of policy communication is multi-level, it is necessary to make greater efforts to integrate domestic resources and strengthen policy support from both parties. The two sides should not only keep the frequent high-level exchanges and dialogues, but also advocates intergovernmental communication within the Arab countries, communication among various ministries within China, exchanges between local governments—such as the establishment of more sister cities and provinces—,[95] as well as communication between think tanks.

At the same time, in the process of building the B&R initiative, the partner countries also should attach importance to ensure the security of interests faced by energy companies in the process of going out and the both governments ought to play the escorting role. Also, China and the Arab states should actively participate in policy communication on the issue of

environmental protection and anti-terrorism operations to enhance mutual political trust and jointly safeguard regional peace and stability, creating the better external condition for stable and far-reaching cooperation.

4.2 Promote Facility Connectivity to Strengthen the Construction of Energy Infrastructure

As the global cooperation platform, the Belt and Road initiative provides a cross-continental transportation channel for China-Arab energy cooperation. There are six major economic corridors[96] under the B&R Initiative, including the China-Central Asia-West Asia Economic Corridor that starts east from China and westward through Central Asia to the Arabian Peninsula. It is a major energy channel, which is the vital areas for the China-Central Asia oil and natural gas pipelines and it will connect Arab countries in the future. It also witnessed the Chinese enterprises have expanded their projects in the Arab countries from housing construction, road and bridge to oil pipelines, communications, railways, ports, building materials and many other fields. Therefore, for satisfying all the needs of the better energy cooperation, the two sides should jointly promote the construction of transport infrastructure firstly, such as railways, highways, ports and aviation. Second, reinforcing the interconnection of energy infrastructure, for example, ensure the security of oil and gas pipelines and other transport routes, build cross-border power supply networks and power-transmission routes, and cooperate in regional power grid upgrading and transformation.[97] Besides, both sides could not neglect the importance of advancing other infrastructure facilities related to the communication, such as cross-border optical cables, satellite stations.

Judging from the current and long-term development strategic plans, the Arab countries need a large number of infrastructure start-up and construction funds, and it is hard for the World Bank (WB) and the Asian Development Bank (ADB) alone to fill the funding gap. The China-led Asia Infrastructure Investment Bank (AIIB) has been established for two years since 2016, which actively plays a financial support role in implementing the Belt and Road strategy and provides more guarantees for infrastructure projects between China and Arab countries. Although the AIIB's business focus is in Asia region, the actual investment scope has covered 12 countries including East Asia, Southeast Asia, South Asia, Central Asia, the Middle East, and West Asia, and 24 projects, including two programs located in Oman: Duqm Port Commercial Terminal and Operational Zone Development Project and Broadband Infrastructure Project, and one in Egypt: Round II Solar PV Feed-in Tariffs Program.[98]

Facing the situation that fluctuate crude oil prices and the irrational pricing mechanism in the international energy market, some countries attempt to use their own economic hegemony to arbitrarily manipulate the market and bring negative impacts on the world economy; although the AIIB may not be able to completely change this situation, it still can help these affected countries to a certain extent. In addition to the role of stabilizing financial markets brought by the short-term financial assistance, considering from the perspective of infrastructure construction alone, in my opinion, giving full play to the role of AIIB could also greatly increase oil and gas output efficiency, reduce transportation costs, release production capacity, and stabilize prices, thereby benefiting those energy exporters and consumers and improving their bargaining power in international

energy market, which have a positive impact and significance on promoting China-Arab energy cooperation.

What's more, based on this report's analysis, I consider that the Belt and Road is an international strategy that requires the concerted efforts of all parties. In addition to the participation of the AIIB, other financial institutions should also be encouraged to take part in cooperation with Arab countries in the field of infrastructure construction, such as the BRICS Bank and Silk Road Funds, which can also provide financial support to expand the scale of investment in infrastructure.

4.3 Ensuring Unimpeded Trade to Reduce Trade Friction in the process of Energy Cooperation between China and Arab Countries

4.3.1 Encourage Diversification of Energy Investments and Improve Relevant Laws and Regulations

The investment and cooperation in the oil and gas industry has always been the leading industry for China-Arab energy cooperation. However, the global energy pattern is in transition, in order to conforms to the trend of environmental protection cooperation, both sides should encourage diversification of energy investment and increase investment in new energy, clean energy, and renewable energy. In my opinion, Chinese companies should follow the direction of local policies while entering the energy markets in Arab countries, especially when the local emerging market is immature. Moreover, Chinese enterprises should collaborate with local companies or companies from other countries, allowing them to learn other companies' advanced technology and management experience, enhancing their ability to deal with risks, increasing investment success rate.

Simultaneously, it is necessary to use established trade dispute resolution mechanisms or set up more comprehensive mechanisms to encourage both parties to resolve commercial disputes and trade friction through mediation and arbitration.[99] Furthermore, I would suggest both sides improve relevant laws and regulations in the legal framework of trade and economic cooperation, such as agreement on avoidance of double taxation, agreements on prevention of tax evasion and fraud, cooperation agreement on infrastructure construction, labor service cooperation and other legal systems, and properly solving trade problems such as dumping, so as to removes obstacles for friendly China-Arab energy cooperation.

4.3.2 Strive to Establish the China-GCC Free Trade Zone

In the Arab world, the Gulf Cooperation Council, referred to as the GCC, consisting of the six countries: Bahrain, Qatar, Oman, Kuwait, Saudi Arabia, and the United Arab Emirates, which was established in May 1981. The GCC countries are China's largest source of oil and liquefied natural gas imports and the important trading partner in the Arab region. Although the EU remains the largest trading partner for the GCC, a report by The Economist Intelligence Unit (EIU) predicted that by 2020, China would be the biggest export market for the GCC.[100] Locating at the junction of the Silk Road Economic Belt and the Maritime Silk Road, the GCC has great significance to strengthening China-Arab energy cooperation and promoting the successful development of the Belt and Road initiative. Gulf oil-producing countries led by Saudi Arabia, have relatively high economic levels, and the political situation of each country is relatively stable, thus the cooperation between

China and the GCC has potential to be tapped. If the two sides actively engage in negotiations and docking, contribute to the early signing of the China-GCC Free Trade Agreement and the successful establishment of a free trade zone, it would deepen energy trade, establish a more perfect cooperative partnership, and promote more energy cooperation projects. Also, it would embody the institutionalization of the Belt and Road cooperative development concept in the Middle East, which would become an important regional fulcrum for the successful implementation of the whole strategy.

4.4 Safeguard Currency Circulation to Enhance the Ability to Resist Financial Risks

First of all, China should increase its foreign exchange reserve. Petroleum reserve[101] can be used as an important supplement to foreign exchange reserves. The petroleum reserve can be divided into three types according to the main body of reserves. The first is the government reserves. As the name suggests, it is entirely funded by the government to purchase, control and maintain the oil reserve, which is included in the government budget. It can serve as a strategic reserve to timely solve and alleviate the problem of the shortage of oil supplies and the soaring oil prices.[102] The second is enterprise reserves, which are borne by oil producers, oil refining companies, sales companies, importers, and large consumers.[103] It contains statutory reserves and the most common commercial reserves. The third is institutional reserves, which are also called intermediary organization reserves, undertaken by public organizations or non-governmental organizations.[104]

These different type of reserves perform their duties and complement each other, therefore how to organically combined and coordinated with each other to establish a systematic national reserve system is remained for scholars to research. As Zhang Guobao, the former director of the National Energy Administration once pointed out that China should encourage companies to use idle commercial capacity to increase oil reserves. It means that China should gradually reduce the scale of government reserves, steadily expand commercial reserves, and fully utilize the functions of private enterprise reserves, which will not only reduce the government's financial burden, but also form the combination of government and corporate power, optimizing the role of them, so as to more effectively safeguard the national oil supply security. At the same time, China should also vigorously develop institutional reserves. The central government could try to organize and encourage oil companies and larger consumers to form a reserve alliance organization with legal personality at an appropriate time, and promulgate relevant oil reserve law that stipulates rights and obligations among the government and alliance agencies and enterprises. Ultimately, the reserve alliance would become the main body of China's petroleum reserves and assume the main task of national oil reserves.

Secondly, China should make full use of financial institutions, commercial banks and multilateral financial institutions including the AIIB and Silk Road Fund to open up financing channels for China-Arab energy cooperation.[105] Also China could actively cooperate with exchanges, securities companies and develop futures, contracts and other forms of transactions to improve the energy market system. In addition, China should expedite settlement in local currency, support financial cooperation negotiation on currency swaps between China and Arab countries, encourage

both sides to sign bilateral currency swap agreements[106] in energy cooperation which would help to enhance their abilities to jointly resist financial risks. Taking the UAE as an example, the People's Bank of China and the central bank of the UAE signed a memorandum of cooperation on RMB clearing in the UAE and agreed on expanding the RMB Qualified Foreign Institutional Investor (RQFII) to the UAE at a quota of 50 billion Yuan on December 14, 2015.[107] The currency swap agreement that signed in 2012 was also extended on the same day.[108] Although the process of changing the petroleum dollar pricing system and realizing the internationalization of the RMB is still tortuous and lengthy, the use of RMB in cross-border trade is emerging. SWIFT data shows that the UAE's use of the RMB in 2015 accounted for 74% of payments by value to China, representing an increase of 52% compared to 2014.[109]

4.5 Promoting People-to-people Exchange to Consolidate the Historical Basis of the Friendship between China and the Arab states for Generations

4.5.1 China Should Maintain Political Independence and Respect the National Freedom and Dignity of Arab countries

The friendship of China and the Arab states can be traced back to the ancient Silk Road over centuries ago. As the former Prime Minister Wen Jiabao once said at the Opening Session of the Fourth China-Arab Business Conference, "both sides went through many hardships and untold sufferings. The Chinese people would never forget that when a massive earthquake struck Wenchuan, China in 2008, the Arab brother offered prompt and generous help".[110] At present, facing the turbulent situation in the Arab region, such as Syria crisis, China would keep maintaining political independence, call on the peaceful political settlement to solve the hot issues, oppose big powers to bully the weak, defend the national dignity of the Arab countries and increase mutual political trust.

4.5.2 Deepen Dialogues among Civilizations, Eliminate Misunderstandings, Seek Common Values, and Respect the Diversity of Civilizations

First, through deepening the dialogue between the Chinese and Arab civilizations, both sides should jointly explore common values and eliminate misunderstandings of each other's civilization. It is undeniable that some Western scholars tried to distort the Chinese civilization and Islamic civilization. For example, Samuel Huntington described Arab Islamic civilization and Chinese civilization as new enemies of the West in his book "Clash of Civilizations and World Order."[111] In response to the proposal of the Belt and Road Initiative, many people have gradually formed a negative view of China and interpreted it as a new Marshall Plan. In addition to the excitement of terrorist and extremists in recent years, many people still equate Islam, Muslims to extremism. Thus, scholars of both sides should correct some irrational misconceptions, maintain right values, and lead positive attitude towards each other.

Furthermore, both sides need to use media a tool, through developing media cooperation and deepening various media plans to communicate, interact, integrate and understand each other, gradually strengthen public diplomacy and improve their soft power. In this regard, the media take the responsibility to convey the correct knowledge and information, which help the public of the two sides to understand the meaning and importance of cooperation.

In addition, the cultural centers could be

the important platform to carry out dialogue between China and the Arab world and the talents on language and culture are the urgent need. The establishment of the Confucius Institute in the Arab world is a good example. Thus, I would recommend that no matter in China or Arab countries, more Arabic or Chinese language teaching center be supported and play a role on training personnel who are familiar with Chinese and Arabic cultures, and cultivating professionals who specialize in culture of both sides.

Both China and Arab countries should respect the diversity of each other's culture, learn from each other and complement each other. It is necessary to fully develop folk cultural exchanges and non-governmental organizations, encourage and support the exchanges of young people for education, arts, culture, sports, tourism and science and technology, ultimately achieving mutual understanding between the people of both sides at the grassroots level.

Conclusion

This dissertation mainly introduces the opportunities and challenges of energy cooperation between China and the Arab states, which uses PEST analysis method. And then I choose Sudan and Saudi Arabia to do case study, respectively analyze the strengths and weaknesses in the process of energy cooperation of Chinese energy companies with those two countries via the SWOT analysis method. In combination with the Belt and Road development strategy, it also provides policy recommendations for future energy cooperation between the two sides.

By systematically generalizing and summarizing related cases, the findings of this paper are intended to show that the global energy governance model is quietly changing in the context of the restructuring of global oil maps and the large-scale flow of global energy elements, coupled with the energy independence policies of the Western countries and low crude oil prices. Under this new situation, the smooth development of energy cooperation between China and the Arab states highly relies on the close cooperation between the two sides. It not only needs to handle issues concerning the upstream and downstream of the energy sector, but also has to deepen into new energy and other sources and diversify energy products, allowing both parties to realize a win-win situation.

In addition, facts have proved that the maturity of the enterprise construction is directly related to the development of energy cooperation between China and the Arab states. And it is important to seize the good opportunities brought by the Belt and Road initiative, which provide the platform for China and Arab energy cooperation. Enriching the "going out" experience, strengthening the internal management system of the company, Chinese energy companies have to fully realize marketization and carry out energy cooperation with Arab states with a more professional market-oriented operation mechanism. So that they can take the initiative in the upper, middle, and downstream oil fields and maximally resist external shocks and ensure real energy security in the turbulent international energy landscape.

Notes

1) Note: The “Silk Road Economic Belt” concept is introduced by Xi during his visit to Kazakhstan in September 2013. He suggests China and Central Asia cooperate on such a belt.
2) Note: Xi proposes a China-ASEAN community and offers guidance on a “21st Century Maritime Silk Road” in October 2013.
3) Helen Chin &Winnie He, 2016, *The Belt and Road Initiative: 65 Countries and Beyond*, FUNG BUSINESS INTELLIGENCE CENTRE. https://www.fbicgroup.com/sites/default/files/B%26R_Initiative_65_Countries_and_Beyond.pdf
4) Idem. pp. 5–6.
5) Note: The concept of Arab states in this paper mainly refers to 22 member countries of the Arab League (1945): Countries in West Asia include Palestine, Jordan, Syria, Lebanon, Saudi Arabia, Iraq, Yemen, Kuwait, United Arab Emirates(UAE), Qatar, Bahrain, and Oman. Countries in North Africa include Algeria, Morocco, Tunisia, and Libya. Sudan, Mauritania, Egypt; countries in northeastern Africa are Djibouti, Somalia, and the Comoros.
6) Xinhua, Chronology of China’s Belt and Road Initiative. http://www.xinhuanet.com/english/2016-06/24/c_135464233.htm
7) Birkenthal, Sara M., “*Grand Strategy in U.S. Foreign Policy: The Carter, Bush, and Obama Doctrines*” (2013). CMC Senior Theses. Paper 598. http://scholarship.claremont.edu/cmc_theses/598
8) John Rielly, *The Bush Administration’s Foreign Policy Legacy*, Politique américaine 2008/3 (N° 12), pp. 73–86. DOI 10.3917/polam.012.0073
9) Birkenthal, Sara M., “*Grand Strategy in U.S. Foreign Policy: The Carter, Bush, and Obama Doctrines*” (2013). CMC Senior Theses. Paper 598. http://scholarship.claremont.edu/cmc_theses/598
10) Note: The Israeli-Palestinian peace process is “an ongoing American-mediated effort to broker a peace treaty between Israelis and Palestinians. The goal is a ‘final status agreement’, which would establish a Palestinian state in Gaza and the West Bank in exchange for Palestinians agreeing to permanently end attacks on Israeli targets”—cited from https://www.vox.com/cards/israel-palestine/peace-process
11) John Rielly, *The Bush Administration’s Foreign Policy Legacy*, Politique américaine 2008/3 (N° 12), pp. 73–86. DOI 10.3917/polam.012.0073
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21) Qian Xuewen, *Sino-Arab Economic and Trade Cooperation: Situations, Tasks, Issues and*

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22) Roschanack Shaery, *Arabs in Yiwu, Confucius in East Beirut*, MER 270 -CHINA IN THE MIDDLE EAST, Vol. 44, 2014.

23) MOFCOM Holds Press Conference of China-Arab States Expo 2017, http://english.mofcom.gov.cn/article/newsrelease/press/201706/20170602594956.shtml

24) Note: The Brookings Doha Center (BDC) and the Shanghai Academy of Social Sciences (SASS) held a joint workshop in Shanghai, China on January 13-14, 2018. The workshop brought together academics and policymakers from China and the Middle East and North Africa (MENA) to discuss China's Belt and Road Initiative (BRI) and its implications for cooperation with the MENA region. https://www.brookings.edu/events/belt-and-road-initiative-towards-greater-cooperation-between-china-and-the-middle-east/
Data cited from: China and Middle East Energy Cooperation Mode Transformation: From Buying Oil to Selling New Energy Technology(中国与中东能源合作模式转型 从买石油到“卖”新能源技术), http://center.cnpc.com.cn/bk/system/2018/01/18/001675776.shtml

25) http://www.mofcom.gov.cn/article/tongjiziliao/fuwzn/swfalv/201708/20170802631105.shtml

26) BP Statistical Review 2017— China's energy market in 2016. https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy/country-and-regional-insights/china.html

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28) Roy Mathew, *Effect of Declining Oil Prices on Oil Exporting Countries*. https://web.stanford.edu/class/e297c/trade_environment/energy/heffect.html

29) Idem.

30) Note: “In recent years, the United States natural gas industry has experiences a quiet ‘revolution’ due to development of new and innovative technologies. From 2005, US's dependence on oil import has dropped from 60 % to 39 % thanks to shale gas. The United States appears well on its way to self-sufficiency in oil and gas and may overcome Saudi Arabia as the world's bigger supplier of hydrocarbons by 2020.” Cited from: The Shale gas ‘revolution’ in United States: Global implications, options for the EU, 2013.
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31) Vice Foreign Minister Zhang Ming Attends the Commemoration of the 5th Anniversary of the Voyage of the “Jewel of Muscat” of Oman (From Chinese Embassy in Oman), 2015.
Note: In this ceremony of celebrating the 5th anniversary of the successful voyage to East Asia of the sailing vessel “Jewel of Muscat”, Vice Foreign Minister Zhang Ming expressed that China and Oman will become closer partners and achieve mutual benefits and win-win results. The Secretary General of the Ministry of Foreign Affairs of Oman noted in his speech that Oman stands ready to, together with China and other Asian countries, build a more vigorous 21st Century Maritime Silk Road to benefit people in Asia.

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執　筆　者　紹　介（掲載順）

勝　又　　均	商学研究科博士課程（前期）	2018 年度在籍　会　計　学
Nguyen Thi Khanh Trang	経済学研究科博士課程（後期）	2018 年度在籍　経　済　学
Ｌｉｕ　Ｔｉｎｇｔｉｎｇ	国際関係学研究科 E-track 修士課程	2018年8月卒業　国際関係学（International Relations）

人文・社会科学研究　東京国際大学大学院　第3号

2018（平成30）年9月20日発行
〔非　売　品〕

編　集　者　　東京国際大学大学院
人文・社会科学研究紀要編集委員

発　行　者　　高橋　宏

発　行　所　　〒350-1197　埼玉県川越市的場北1–13–1
TEL（049）232－1111

印　刷　所　　株式会社東京プレス
〒161-0033 東京都新宿区下落合3-12-18 3F

BULLETIN OF SOCIAL SCIENCES AND HUMANITIES

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