

ISSN 1883-1656



Центр Российских Исследований
RRC Working Paper Series No. 64

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under Declining Oil Prices?**

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November 2016

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Abstract

This paper investigates whether Russia's expansion of military goods can be Impossible Mission Force (IMF) for its V-Shaped growth recovery under declining oil prices. Looking at long-run relationships between domestic outputs and international oil prices for 1995–2016, we focus on the impact of the military output expansion on growth of GDP and manufacturing for 2011–2016. We demonstrate that the military output expansion checked further growth retardation for 2012–2014 as a counter power against deteriorating oil prices or economic sanctions, while the military output expansion would not be likely to bolster up Russia's growth from 2015 onward without next oil windfalls.

Key words: military goods, international oil price, Impossible Mission Force, growth

JEL codes: F51, F52, H56, L64

1. Introduction

A Hollywood action motion picture series of “Mission: Impossible” starring Tom Cruise assumes a fictional, heroic agency named “IMF (the Impossible Mission Force)”. This fictional IMF may remind some economists of actual IMF (the International Monetary Fund). In fact, actual IMF appeared in Moscow like a fictional IMF immediately after the Collapse of the USSR. Their mission was to stabilize Russian economy through liberalization of prices, foreign trade and foreign exchanges with structural reforms such as privatization. They implemented a series of measures for this mission just quickly in 1992, which is called a shock therapy. In 1993 they thought their mission would be completed within a short period, say three months (author’s interview with an economist at the IMF Moscow office). However, budget deficits continued. Employing short-term treasury bonds with high returns to compensate for the deficits induced speculations involving world leading investment organizations relying on actual IMF. This finally led to the 1998 financial crisis. Unlike the movie, actual IMF’s mission was not completed, whereas they did not explain their failures.

Then, Mr. Putin appeared as a heroic president like Tom, armed with a natural gift or oil windfalls due to continuing rises of international oil prices for 1999–2008. These long-run oil shocks or adverse oil shocks were the historical events that we have never experienced. Regardless, thanks to oil windfalls, Putin could successfully reorganize or re-centralize key industries, including oil and gas, passenger cars and military production, reimbursing international debts succeeded from the USSR. People could also enjoy the boost of imports based on increasing wages and pensions with appreciating rubles. Oil bubbles were gone with the Lehman shock in 2008–2009 even though international oil prices revived again after 2010. Again oil prices largely fell down in 2015, and still remains at a lower level in 2016. Putin’s mission of diversification of the economy to be away from oil dependence, supported by the second fictional

IMF, that is to say, increasing international oil prices, was not completed. Conversely, it may be stated that present-day Russia made its Soviet legacy of oil dependency much stronger.

However, looking at the growth of GDP and manufacturing for 2011-2015, it is worth investigating whether there was some countervailing power against falling oil prices, including the impact of military outputs and exports which is expected to be the third Impossible Mission Force. Military goods with strong competitiveness and product differentiation is, indeed, another Soviet legacy for present-day Russia.

2. Long-run relationships between economic growth and oil prices in Russia

Most of economic variables in Russia have been exposed to changes in international oil prices. We can confirm this by an estimator of canonical cointegrating regression (CCR). **Figure 1** displays Russia's real GDP growth with Urals oil prices for 1995Q1–2016 Q2. Data on real GDP was seasonally adjusted by the so called Census X-13.

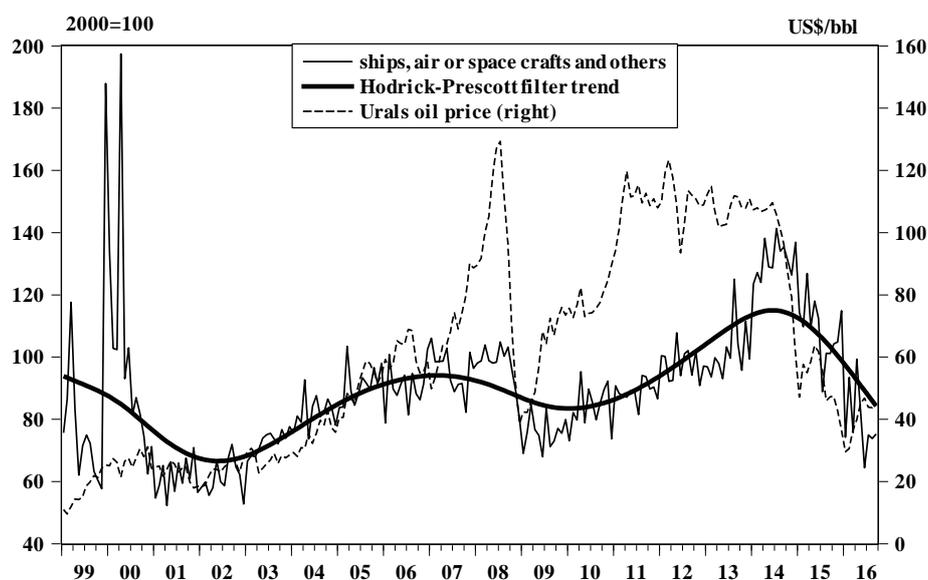


Figure 1. Russian GDP growth and oil prices for 1995Q1–2016Q2

Sources: Author's calculations based on Rosstat (CEIC) and Bloomberg-Thomson-Reuters.

Using CCR for sample (adjusted) 1995Q3–2016Q2, we have the following long-run cointegrating equation:

$$gdp = 0.176oil + 3.949 + 0.006t \text{ (annualized trend rate of 2.4\%)}, \quad (1)$$

$$[3.311] \quad [27.73] \quad [3.807] \quad \text{adj.R}^2 = 0.972$$

where $gdp = \log(\text{real GDP})$, $oil = \log(\text{oil price})$, t : time trend, and $[.]$: t-statistic. All coefficients are at the 1% significance level.

Equation (1) implies that, in the long-run, a 10% increase (decrease) in oil prices would lead to 1.8% growth (contraction) of real GDP. Underlying trend rate, which, in Russia, equals TFP (total factor productivity) in production function, is fairly 2.4%.

When we carefully look at recent movements in [Figure 1](#), we find that, for 2014Q3–Q4, Russian growth decline to the previous period was only 0.1% despite a large decrease in international oil prices, 25%. Moreover, for 2015Q2–2016Q1, the Russian growth decline was merely 0.3% in spite of a marked fall of international oil prices, 47%. This suggests that some factor might have checked further declines of GDP growth as a countervailing power against huge drops in oil prices.

[Figure 2](#) shows Russian growth of monthly manufacturing output with international oil prices. Monthly manufacturing output is seasonally adjusted by X-13.

Employing CCR for sample (adjusted) 1995M03–2016M09, we have the following long-run cointegrating equation:

$$manu = 0.205oil + 3.869 + 0.0016t \text{ (annualized trend rate of 2.0\%)}, \quad (2)$$

$$[7.950] \quad [53.66] \quad [6.522] \quad \text{adj.R}^2 = 0.942$$

where $manu = \log(\text{real manufacturing output})$. All coefficients are significant at the 1% level.

Equation (2) means that a 10% increase in international oil prices would result in 2% growth of manufacturing output with underlying trend rate of 2%. Oil elasticity of manufacturing is slightly higher than that of GDP, while the underlying trend of manufacturing is slightly smaller than that of GDP. It is noteworthy to learn that, unlike the Dutch Disease, Russia, suffering the

Russian Disease, showed a strong growth under favourable external conditions simply because most of manufacturing goods, except for refined oil and military goods, were not for exports but for domestic uses.

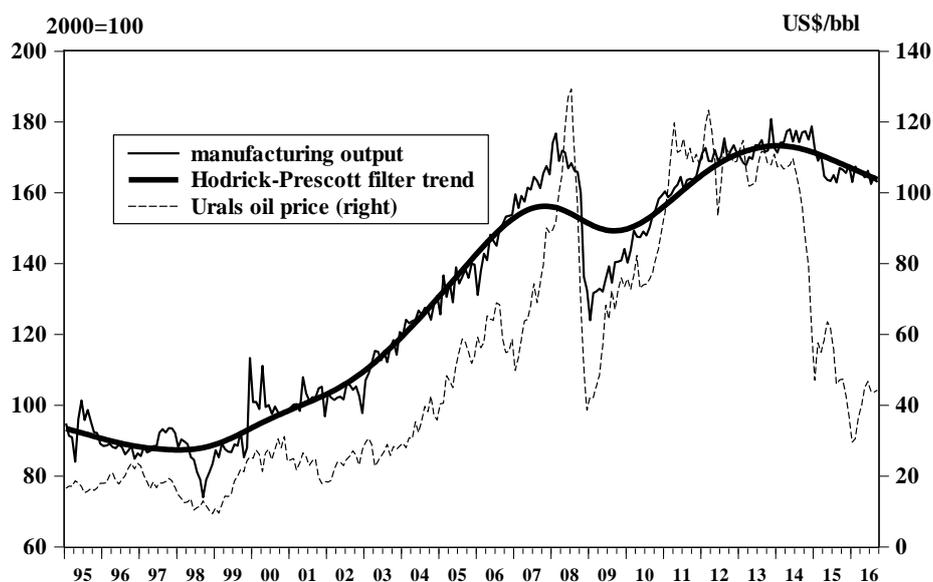


Figure 2. Russian manufacturing output and oil prices for January 1995–September 2016

Sources: Author’s calculations based on Rosstat (CEIC) and Bloomberg-Thomson-Reuters.

Seeing recent movements in [Figure 2](#), we also find that, for 2014M09–M12, seasonally adjusted decrease in the growth rate to the previous period was only 1% despite a large decrease in international oil prices, 36%. Furthermore, for 2015M09–M12, that was only 0.5% in spite of an oil price decrease of 22%. Since 2013M12 Russian manufacturing output has fallen by 6% with an oil price drop of 60%. These facts may suggest that manufacturing itself has checked a further slowdown of GDP and that some factor might have bolstered up manufacturing output.

Investigating what is this factor, we find an industrial sector’s irregular movements for these three years.

As is shown by [Table 1](#), “other transport equipment”, including ships, aircraft, spacecraft, locomotives and others, showed remarkable developments in December of 2014 and

2015. As a result, annual average growth rate of this sector in 2014 amounted to 29% much higher than overall manufacturing growth, while, despite 55% growth of the sector to the previous month in December 2015, its annual average growth showed a marked decline of 17% in overall 2015. This “other transport equipment” is likely to be dominated by military transport outputs as will be discussed below.

Table 1. Growth of “other transport equipment”

| | Overall manufacturing | Machinery & Equipment | Electrical, electronic & optical equipment | Transport equipment | of which: Other transport equipment (ships, aircraft, spacecrafts & others) |
|---|-----------------------|-----------------------|--|---------------------|---|
| monthly growth rate (to previous month) % | | | | | |
| Dec.2013 | 1.8 | 1.4 | -1.6 | 11.3 | 21.3 |
| Dec.2014 | 9.2 | 29.8 | 13.3 | 41.6 | 50.9 |
| Dec.2015 | 8.4 | 26.3 | 9.0 | 41.8 | 55.2 |
| annual average growth rate % | | | | | |
| 2013 | 0.6 | -3.5 | -1.0 | 2.2 | 4.8 |
| 2014 | 2.1 | -7.9 | -3.4 | 12.7 | 29.2 |
| 2015 | -5.4 | -13.0 | -10.2 | -19.8 | -17.3 |

Sources: Rosstat (CEIC) database.

Notes: Monthly growth is not seasonally adjusted.

Figure 3 demonstrates movements of the “other transport equipment” sector and its trend with oil prices. Growth of this sector was seasonally adjusted by X-13.

Similarly, CCR yields the following cointegrating equation:

$$militr = 0.178oil + 3.776, \quad (3)$$

$$[3.385] \quad [18.14] \quad adj.R^2 = 0.275$$

where $militr$ = log(real “other transport equipment” output). All coefficients are significant at the 1% significance level. Phillips-Ouliaris test rejects null hypothesis: series are not cointegrated, at the 1% significance level. Oil elasticity of equation (3) is similar to that of equation (1), while equation (3) is not supported by a linear trend and its goodness-of-fit is rather poor. Regardless,

military transport equipment or “other transport equipment” has also been exposed to changes in oil prices in the long-run.

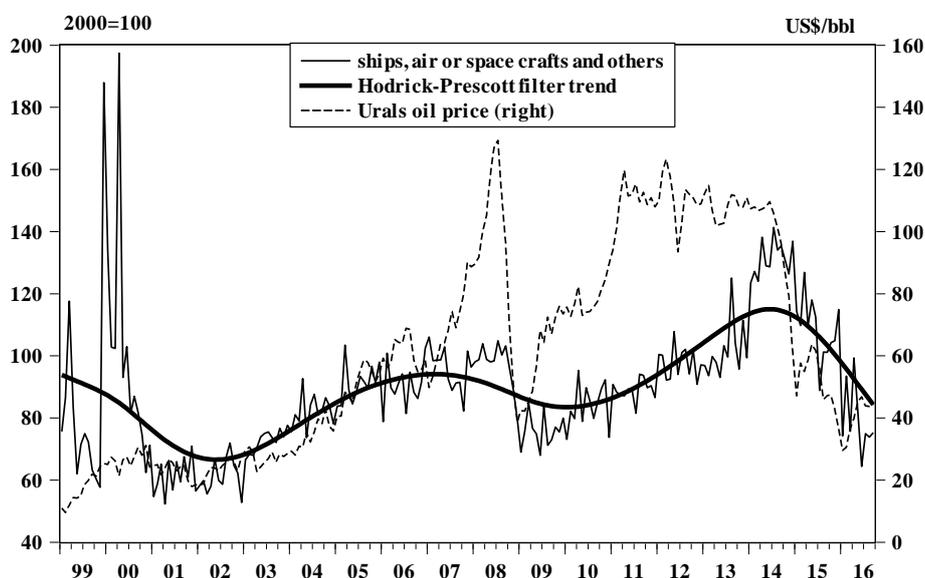


Figure 3. Russian “other transport equipment” output and oil prices for January 1999–September 2016

Sources: Author’s calculations based on Rosstat (CEIC) and Bloomberg-Thomson-Reuters.

3. Russian military goods in the national accounting

On April 4, 2016, Rosstat released a new series of overall current GDP at market prices as well as sectoral value-added at basic prices on their website.¹ They made large upward revisions of current GDP and sectoral value-added for 2011–2015. When we look at the disaggregated version of data on sectoral value-added, we witness an interesting change that Rosstat reclassified two disaggregated sectors. Russian sector classification code, introduced in

¹ Cooper (2016) provides an outline of Russian military developments for these twenty five years. However, he did not show any new evidence for the military goods in the national accounting.

2003, follows an international code (NACE version1.1). Two of Russian disaggregated sectors prior to April 4, 2016 consist of the followings: A1. Other transport equipment (Code 35), and A2. Other manufacturing (Codes 37 + 23.3 + 24.61 + 29.6), where

Code 35: Manufacture of other transport equipment which includes:

- 35.1 Building and repairing of ships and boats;
- 35.2 Manufacture of railway and tramway locomotives and rolling stock;
- 35.3 Manufacture of aircraft and spacecraft;
- 35.4 Manufacture of motorcycles and bicycles, and
- 35.5 Manufacture of other transport equipment and not elsewhere classified,

Code 23.3: Processing of nuclear fuel,

Code 24.61: Manufacture of explosives (gunpowder etc.),

Code 29.6: Manufacture of weapons and ammunition, and

Code: 37: Recycling.

These are reclassified into following new sectors: B1 (Codes 35 + 23.3 + 24.61 +29.6), and B2 (Code 37). Obviously, goods of codes 23.3, 24.61and 29.6 are military goods. Code 35 can also be considered the military goods even though 10 to 20 % of the goods of Code 35 are for civilian uses. Thus, the new classification clearly aggregates the military goods into the single sector (B1), while non-military recycling is classified into another sector (B2). This may imply that Russian authorities recognize the important role and position of the military goods in the national accounting and economic growth, and that they would like to reveal the presence of their respectable competitive goods with better product differentiation.

Table 2 presents data on the military goods (sector B1) in the newly released national accounting of GDP.

Table 2. Value-added of Russian military goods

| | | Current GDP or values-added: in current bln rubles | | | | |
|----------------------------|---|--|--------|--------|--------|--------|
| | | 2011 | 2012 | 2013 | 2014 | 2015 |
| <i>Military goods (B1)</i> | | | | | | |
| 1 | Current value-added | 453.9 | 589.1 | 658.7 | 838.9 | 944.0 |
| 2 | % real change | - | 11.73 | 7.58 | 7.61 | -4.85 |
| 3 | Share in GDP % | 0.8 | 0.9 | 0.9 | 1.1 | 1.2 |
| 4 | Share in manufacturing value-added % | 6.6 | 7.7 | 8.0 | 9.1 | 9.2 |
| 5 | Contribution to GDP growth rate % | - | 0.09 | 0.07 | 0.07 | -0.05 |
| 6 | Contribution to manufacturing value-added growth rate % | - | 0.78 | 0.58 | 0.61 | -0.44 |
| 7 | Current GDP | 59,698 | 66,927 | 71,017 | 77,945 | 80,804 |
| 8 | % real change | 4.26 | 3.52 | 1.28 | 0.71 | -3.73 |
| 9 | Current manufacturing value-added | 6,830 | 7,693 | 8,282 | 9,209 | 10,245 |
| 10 | % real change | 6.28 | 5.44 | 4.40 | 0.58 | -5.06 |
| 11 | Budgetary defence expenditure (% GDP) | 2.5 | 2.7 | 3.0 | 3.2 | 3.9 |

Sources: Author's calculations based on Rosstat (www.gks.ru) as of April 4, 2016.

Notes: Value-added is in basic prices, excluding net taxes on products, while GDP is in market prices. Military goods in this table consists of the following codes (NACE v. 1.1): 35 Manufacture of other transport equipment (ships, railway locomotives/rolling stock, aircraft, spacecraft etc.); 23.3 Processing of nuclear fuel; 24.61 Manufacture of explosives (gunpowder etc.); 29.6 Manufacture of weapons and ammunition.

<http://ec.europa.eu/eurostat/ramon/nomenclatures/>

As is shown, the share of value-added of the military goods sector at basic prices in the overall GDP showed increases from 0.8% in 2011 to 1.1% in 2014 and 1.2% in 2015 much larger than the share of automobiles. If we measure its value-added at market prices, the share would be

over 2%. The share in overall manufacturing value-added at basic prices amounted to 7% in 2011 and increased to 9% in 2014 and 2015. The military goods value-added in real terms showed rather high growth from 12% to 8% for 2012–2014 and showed a contraction of 5% in 2015.

Figure 4 demonstrates the share of the military goods value-added growth contribution in the overall GDP growth, while Figure 5 shows that in the overall manufacturing value-added growth.

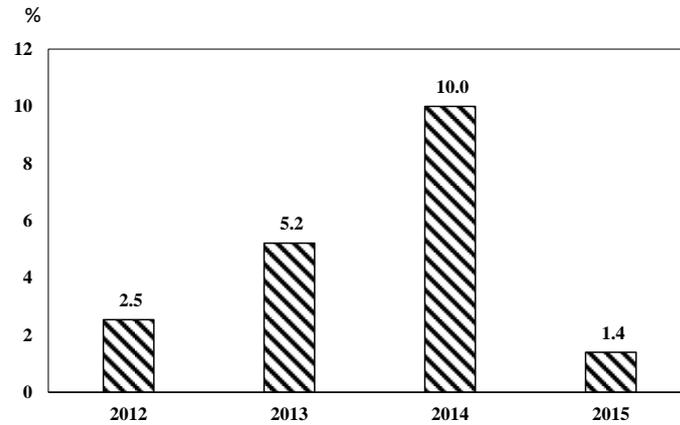


Figure 4. Share of military goods contribution in GDP growth rate (%)

Sources: Author's calculation based on data of Rosstat website as of April 4, 2016.

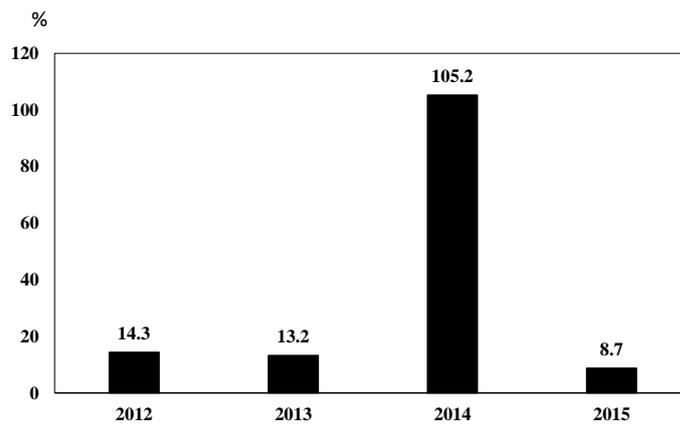


Figure 5. Share of military goods contribution in growth rate of manufacturing value-added (%)

Sources: Author's calculation based on data of Rosstat website as of April 4, 2016.

Figure 4 shows the military goods contribution share in GDP growth increased from 2.5% in 2012 and, indeed, to a large contribution of 10% in 2014. In 2015, its contribution to GDP contraction was rather small, 1.4%. Figure 5 demonstrates large contributions of the military goods sector to overall manufacturing. The growth rate of 0.6% of manufacturing value-added in 2014 was entirely brought about by the military goods sector. However, the military goods contribution to the contraction of 5% of manufacturing in 2015 was not so large. The slowdown of GDP and manufacturing growth was checked by the military goods expansion, while their further slowdown could not be bolstered up.

Table 3. Russia's defence revenue

| | 2011 | 2012 | 2013 | 2014 | 2015 |
|--------------------------|--------|--------|--------|--------|--------|
| Defence revenue mln US\$ | 12,626 | 15,797 | 21,404 | 24,054 | 18,866 |
| of which: | | | | | |
| Almaz-Antey | 3,552 | 5,754 | 8,326 | 9,210 | 6,966 |
| Russian Helicopters | 2,644 | 3,489 | 3,406 | 3,960 | 3,194 |
| Defence revenue % GDP | 0.6 | 0.7 | 1.0 | 1.2 | 1.4 |
| Real growth rate % | | | | | |
| Defence revenue | - | 13.1 | 22.2 | 12.1 | 5.3 |
| of which: | | | | | |
| Almaz-Antey | - | 46.4 | 43.7 | 12.7 | 1.5 |
| Russian Helicopters | - | 19.2 | -3.0 | 18.4 | 8.3 |
| common deflator % | - | 16.2 | 3.9 | 18.4 | 18.3 |

Sources: Current defence revenue: Defence News World top 100 military enterprises for 2013–2016. <http://people.defensenews.com/top-100/>. Common deflator: Author's calculation from Rosstat data on military goods for 2011–2015. Annual growth rate: Author's calculation from current revenue and deflator.

Notes: Concern Radioelectronic Technologies' revenue (1,618 mln US\$) is excluded in this table for 2015 because of lack of data of this company in 2014.

Table 3 shows Russia’s defence revenue derived from defence revenues of Russian military enterprises ranked in Defence News World Top 100 military enterprises.

“Revenue” in this table may mean sales which are much larger than value-added. However, the trend of GDP share in this table well corresponds to data in **Table 2**. According to our estimates, the growth rate of the defence revenue for 2012–2014 is much larger than that of the military goods value-added in **Table 2**. In 2015, the defence revenue might have shown positive growth.

Russian major defence enterprises, exceptional manufacturing industry in Russia with oil products, are export-oriented for Asia (India and China etc.), Latin America and Africa. Therefore, some watchers saw Russian defence industry’s bumper years despite sanctions and oil price falls.

Table 4. Russian military exports

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---------------------------|------|------|------|------|------|------|
| military exports bln US\$ | 8.7 | 10.7 | 12.9 | 13.2 | 13.2 | 14.5 |
| % in total exports | 2.0 | 1.9 | 2.2 | 2.2 | 2.4 | 3.7 |
| % in total GDP | 0.6 | 0.5 | 0.6 | 0.6 | 0.6 | 1.1 |

Sources: Reuters, World News, March 29, 2016. <http://www.reuters.com/article/us-russia-arms-idUSKCN0WV1TB>, https://sputniknews.com/trend/russian_arms_export/, https://www.linkedin.com/pulse/russian-defence-industry-enjoys-bumper-year-despite-steve-macvicar?articleId=8389760618103443831#comments-8389760618103443831&trk=sushi_topic_posts_guest.

Notes: Exports for 2010–2012 are Rosoboronexport’s exports.

Table 4 shows Russian military exports. As can be seen, Russian military goods exports in current US\$ terms increased for 2010–2015. If these figures reflect actual situation of the Russian military industry, the share of the military goods value-added at market prices would be

much larger than that shown in [Table 2](#), say higher than 2%. Some fragmentary information shown here suggests some possibility that the Russian military industry is still growing despite falling oil prices. Needless to say, as Federal budget revenue heavily depends on oil prices, a reduction in defence spending is today's task for Mr. Putin. In this context, State orders (*goszakaz*) for military goods cannot be raised under falling oil prices. Mr. Putin has to expect only developments in military exports with keeping Russian own procurements for local conflicts. Russia cannot expect Japanese or Korean or Taiwanese miracles supported by booming procurements for Korean War or Vietnamese War. Therefore, it is rather difficult to say that the military expansion can be Impossible Mission Force for Russia's V-shaped economic growth under falling international oil prices. Mission is unlikely to be completed without a miracle of rising oil prices.

4. Concluding remarks

We studied movements of the military goods sector and its impact on growth of GDP and manufacturing. We demonstrated that the military expansion strongly checked further growth retardation in Russia for 2012–2014, while it was likely to insufficiently bolster up Russia's growth in 2015. Lack of the 2011 bench-mark disaggregated input-output system with supplementary tables for distribution margins and net taxes on products, at this moment, it is rather difficult to capture the whole picture of the military goods sector. For example, we do not know whether the foreign trade revenues of the military giant, *Rosoboronexport* under the State corporation *ROSTEC*, monopolizing defence exports, are recorded as trade margins or the military production sector's value-added. We do not know the export tax system of the military goods, neither. As in the case of GDP of the oil and gas sector, we should investigate the full size of GDP of the military goods using disaggregated input-output data with supplementary tables. Regardless, Putin's plan for the structural reform for exports, raising machinery export share up to more than

20% in 2020, is insufficiently implemented only in the defence industry. However, unlike Toyota or Apple, the defence industry cannot involve massive consumers all over the world. Therefore, the military expansion would not finalize its mission of V-shaped recovery of the Russian economy. Mission will be not completed.

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