Italian F-35 Lightning II Program
Economic Impact Assessment

3 February 2014
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Section 1

Overview
Overview

• In 2013-2014, PricewaterhouseCoopers - Italy (PwC - Italy) Conducted a Comprehensive Economic Impact Assessment of the F-35 on the Italian Economy.

• The Study Identifies:
  • Italian Investment in the F-35 Program;
  • Economic Value Added to Italian Economy (direct, indirect and induced) as a Result of F-35 Production;
  • Employment Generated (direct, indirect and induced).

• The quantification was conducted by means of a Combined Approach, which included:
  • Direct Observation by Surveys, interviews and analysis of financial statements [direct impacts];
  • an extended Econometric Input-Output Modeling [indirect and induced impacts].
Section 2

Facts and Figures
JSF Program and Italy

• The JSF Program represents the Most Advanced Initiative in Fighter Jet Development, Production and Sustainment.

• Initiated in the 90s, the Program involves several countries, which, depending on their contribution in investments for the research and development phase and number of purchased jets, are eligible for different amounts of offered opportunities in the production and sustainment phases.

• Italy, with a 4% involvement in the initial phases of the JSF Program, represents a Level II Partner.
Research & Development Investments

- During pre-production phases, the Italian government invested $1 billion for the research and development. Additional $0.9 billion is being invested for the Production Sustainment and Follow-on Development phase.
- Research & Development Investments are not included for the calculation of economic benefits (value added and employment).
Production Investments

- To have all the required machining, tools, factories, etc. to produce components and perform assembly activities, a total of $1.7 billion investments is to be spent in Italy.

- Half a Billion Dollars is represented by imports (of which 95% is accounted for by Lockheed Martin and only 5% by Italian companies); the remaining $1.2 billion is invested in Italy by Italian companies or by the Ministry of Defense.

- Investments on production facilities and assets have been taken into account for the calculation of economic benefits (value added and employment).
Production Opportunities

- **$667 million in contracts** have been let to more than **27 Italian companies** to date; production value projected to be worth several billion dollars.

- **Additional production opportunities** to be offered as production matures.

- Production opportunities have been set according to the participation share and to the number of jets to be acquired by Italy.

Areas of **Italian Industrial Participation**:

- Wing Manufacturing
- Electronics
- Machining
- F-35 Mating/Finishing
- Structures
- Support Equipment
- Engineering Support
- Cockpit Lighting

Almost $0.7 billion completed
Production vs. Investments

- In the period between 2007 and 2014, **80% of the investments** to support production will be completed.
- Conversely, by 2014, the Italian economy and labor market only benefits from a **3% - 4% share of the full potential returns** from production orders; most of the benefits will accrue after 2016.
Section 3
Methodology for Impact Assessment
Methodology – direct impacts

• The direct impacts have been quantified by means of the direct observation of a sample of Italian companies.

• The sample covered Companies representing all different involved sectors (i.e. wings, assembly, machining, electronics, structures and equipment).

• The analysis considered:
  • Value, type and location of investments made (and/or planned in the future);
  • Origin and value of production inputs (Import vs. domestic);
  • Number of direct workers per level of production.

Overall the direct observation phase covered about 62% of the overall expected production value.
Methodology – indirect and induced impacts

- The indirect and induced impacts calculation is based on a model resulting from the World Input Output Database (WIOD). The WIOD is recognized by the European Commission (EC) and the Organization for Economic Co-operation and Development (OECD).

- The input output model allowed for the calculation of Indirect effects and Induced effects.
Section 4

Impact Assessment
What kind of benefits to expect?

• Both Investments involving Italian companies and Production Activities result in an effect on the Italian market in terms of economic benefits (value added) and demand for labor.

• This impact is differentiated into:
  • Direct impact refers to the amount of value (economic benefit or demand for labor) directly related with Italian companies producing components (or, in the case of investments: plants, tools, machines, etc.) for Lockheed Martin’s or any other JSF consortium member, which purchase them;
  • The indirect impact, on the other side, arises as these Italian companies have suppliers themselves; which thus receive orders and produce sub-components, provide materials, etc.;
  • The induced effect is due to employees spending their wages in Italy, thus contributing to the overall Italian economy.

Value added = sum of profit, government income, labor cost, and depreciation cost
**Value added**

- Total opportunities have been calculated to result in approximately $15.8 billion of Value Added in the total period (2007 – 2035).
- Value Added is the result of investments, production, and consumption by direct and indirect employees.

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Induced</th>
<th>Indirect</th>
<th>Direct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>$15,756</td>
<td>$3,614</td>
<td>$2,863</td>
<td>$9,280</td>
</tr>
</tbody>
</table>

60% of the benefit resulting by production is generated by the companies directly involved in the Program.

$1.08 return into the Italian economy for each dollar spent in the JSF Program.
Employment

- The F-35 Program is Expected to Support More Than **6,300 Jobs** in the Peak Year of Production.
- The Peak for New Jobs is Reached in 2019.

![Graph showing employment impact]

Every Direct F-35 Job Creates an Additional **1.17 Jobs** in Italy

More than **6,300 jobs** in the peak year
Employment

- Demand for Labor Remains at its Highest Levels From 2017-2023.
- The F-35 Program Will Sustain an Average of 5,450 Jobs Annually in Italy from 2017 to 2026.
Section 5
Additional Benefits
New Jobs from FACO and Sustainment Activities

• The FACO in Cameri is also Positioned to Serve as the Maintenance, Repair, Overhaul (MRO&U) Center of Excellence for the European and Mediterranean F-35 Fleet.

• The FACO in Cameri is has capability to accomplish Assembly Work for additional countries.

• The Full Spectrum of Sustainment Activities Includes: management & Planning; maintenance, Repair, Overhaul & Upgrades; supply Chain Management; support Activities.

• Lockheed Martin Projects Sustainment Work Conducted in Italy Will Support an Additional 1,900 Direct Jobs Over the Life of the Program (30+ years).
New Technologies

• More Than Half of Italy’s Industrial Participation is Focused on the Application of New, **Highly-Complex Manufacturing Techniques** Used in the Construction of Wing and Related Composite Materials.

• These Technologies Will Help Italian Industry Differentiate Itself in the Global Aerospace Market, Creating Additional Competitive Advantage and Opening New Market Opportunities.
Section 6

Summary
Summary

• The F-35 Production Program Will Support More than 6,300 Jobs in Italy in the Peak Year.

• The F-35 Production Program Yields $15.8 Billion in Economic Benefits for Italy.

• The F-35 Production Program Empowers Italian Industry and Workers with New, High-Technology Skills.

• Italy is Positioned to Realize Additional and Substantial Economic Benefits Through F-35 Sustainment. Sustainment work potential for 1900 additional direct jobs (Calculated by Lockheed Martin).
Appendix 1

Methodology for Impact Assessment
**What triggers macroeconomic effects?**

- PwC model quantifies the economic impact in Italy of the JSF **Production** phase and of the relative support **Investment** phase.

- Initial **R&D Investments** by Italy has not been considered.

- The effects generated by **Testing & Training** are not considered in this quantitative analysis.

- Also the effects resulting from the **Sustainment** and the **Technology Spillover** are not included in the quantitative analysis by PwC.

- Lockheed Martin has carried out a preliminary assessment of the potential impact of Sustainment activities which is provided in slide 18.
Appendix 1 – Methodology for Impact Assessment

**How the model works...**

- The **direct effects** have been derived based on company data (survey on 5 companies representing different sectors and more than 60% of program value in Italy).

- The econometric input-output model for Italy quantifies the **indirect and induced effects** within Italy.

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**Input data from Lockheed Martin, Ministry of Defense and survey**

**Direct Output** = Production value

**Spend for**

- Imports (imports from foreign countries)
- Domestic input (supplied by Italian companies)
- Employee compensation
- Profit, depreciation, etc.

**Direct**

**Direct Value Added**

**Demand in Italian economy**

**Income spent** (demand in Italian economy)

**Indirect**

**Indirect employment**

**Indirect Value Added**

**Induced output = Indirect production**

**Induced employment**

**Induced Value Added**

**Induced output = Indirect production value**

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**Example Input-Output Table of a closed economy**

<table>
<thead>
<tr>
<th></th>
<th>To</th>
<th>From</th>
<th>Total Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Sector</td>
<td>Q1</td>
<td>Q2</td>
<td>Q3</td>
</tr>
<tr>
<td>Secondary Sector</td>
<td>Q4</td>
<td>Q5</td>
<td>Q6</td>
</tr>
<tr>
<td>Tertiary Sector</td>
<td>Q7</td>
<td>Q8</td>
<td>Q9</td>
</tr>
<tr>
<td>Public Consumption</td>
<td>Q10</td>
<td>Q11</td>
<td>Q12</td>
</tr>
<tr>
<td>Private Consumption</td>
<td>Q13</td>
<td>Q14</td>
<td>Q15</td>
</tr>
<tr>
<td>Other Final Demand</td>
<td>Q16</td>
<td>Q17</td>
<td>Q18</td>
</tr>
</tbody>
</table>

**Primary Inputs to Production**

- Wages & Salaries
- Gross operating surplus
- Taxes
- Imports

**Primary Inputs to Final Demand**

- Intermediate Demand
- Final Demand

**Intermediate Demand**

- Expenditure on demand in Italian economy

**Final Demand**

- Total Supply

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**Direct Value Added**

- Order volume
- Direct Output = Production value
- Spend for

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**Indirect Value Added**

- Indirect output = Indirect production

---

**Induced Value Added**

- Induced output = Indirect production value

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**Appendix 1** – Methodology for Impact Assessment
Appendix 1 – Methodology for Impact Assessment

**How the model works...**

Direct effects are based on planned production output (step 1).

Gross Value Added, the direct employment as well as employee compensation - is represented in step 2. In step 2, imports from other countries are discarded from the analysis because they do not generate impacts into the Italian economy.
How the model works...

The occurring direct effects have two main reaction chains in consequence resulting from the demand for Italian goods and services due to production input demand (3a) and due to income spend (3b).

The calculation of both reaction chains is based on the extended Input-Output Model for Italy (step 4). This model quantifies the socio-economic contribution of the JSF program to the Italian economy up to 2035.
Appendix 1 – Methodology for Impact Assessment

How the model works...

Applying the model results in the quantification of indirect socio-economic effects, step 5, that resulted from the reaction chain evolved in 3a.

These indirect effects also imply induced effects from indirect consumption, which are represented in step 6 along with the induced effects from direct consumption that resulted from the reaction chain evolved in 3b.
The PwC IO model conservatively anticipates economic structural changes over time. The VA and Labor multipliers consider:

- productivity increase;
- domestic supply share variations;
- technology changes;
- value added intensity;
- adjustments for inflation;

Charts on the left refers to two of the most indirectly activated sectors by the JSF program in Italy.
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