

# A Comparison of the Financial Management Characteristics of UK vs. EU Manufacturing Firms

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## **Abstract**

*When two economies are integrated, the financial management characteristics of firms in the two economies tend to become similar. Germany and France are two original members of the EU since 1957 and they have fully integrated economies. The UK joined the EU in 1973. In a recent national referendum, British people voted to leave EU membership. It is often argued that, although the UK was a member of the EU, it was not a part of the European Monetary System and UK economy has never fully integrated with the EU economy. In this paper, we test this hypothesis by comparing the financial management characteristics of UK manufacturing firms with the financial management characteristics of EU manufacturing firms (as represented by a combined sample of German and French Manufacturing firms). Our MANOVA test statistics indicate that the financial management characteristics of UK and EU manufacturing firms are significantly different. Accounts receivable collection period is significantly shorter and inventory turnover is significantly higher in UK firms than in EU firms. However, EU firms have significantly higher total assets turnover compared with UK manufacturing firms. UK manufacturing firms use more debt financing (i.e., they have more bankruptcy risk), and they have higher profitability ratios, compared with EU manufacturing firms.*

**Keywords:** Financial Ratios; UK, German, and French manufacturing firms; MANOVA (Multivariate Analysis of Variance)

**JEL classification:** G30, G31, G32, G33

## **1. Introduction**

Comparing the financial management characteristics of different groups of firms has long been a popular methodology in finance. Altman (1968), Beaver (1968), Deakin (1972), Moyer (1977), Edmister (1972), and Dambolena and Khoury (1980) predict bankruptcy by comparing the financial management

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characteristics of bankrupt and non-bankrupt firms. Stevens (1973), Belkaoui (1978), Rege (1984), and Meric et al. (1991) identify the financial management characteristics of firms that have been corporate takeover targets by comparing them with firms that have not been corporate takeover targets. Hutchinson et al. (1988) and Meric and Meric (1992) identify the financial management characteristics of firms which achieve stock market quotation by comparing them with firms that do not have stock market quotation. Meric et al. (2000) compare the financial management characteristics of Japanese *kieretsu*-affiliated and independent firms to identify the financial management characteristics of *kieretsu*-affiliated firms.

A number of studies compare the financial management characteristics of firms in different countries. Kester (1986) and Wald (1999) compare the capital and ownership structures of firms in different countries and they find significant differences. Meric and Meric (1989 and 1994) compare the financial management characteristics of U.S. and Japanese manufacturing firms and they find significant differences. Meric et al. (2003) find significant differences between the financial management characteristics of U.S. and Canadian manufacturing firms.

Germany and France are two original members of the EU since 1957. They have fully integrated economies and their manufacturing firms have similar financial management characteristics. The UK became a member of the EU in 1973. One would expect the financial management characteristics of UK manufacturing firms to be also similar to the financial management characteristics of German and French manufacturing firms. In a recent referendum, British people voted to leave EU membership. Some argue that the UK was not a member of the European Monetary System, it never adopted the *euro* as its national currency, and EU economy has really never fully integrated with EU economy. In this paper, we test this hypothesis by comparing the financial management characteristics of UK manufacturing firms with the financial management characteristics of EU manufacturing firms as represented by a combined sample German and French manufacturing firms.

## **2. A Brief Description of UK, German, and French Economies**

As would be expected, there are many similarities between the economies of the UK, Germany and France. Until recently, all three countries were influential members of the European Union. All three nations are members of NATO and the G8 and G10. They are the three largest economies in Europe based on Gross Domestic Product (GDP), and provide relatively high standards of living to their citizens. They have similar GDP per capita ratios, with Germany's being slightly higher than France and the UK, as seen in Table 1. The UK and France have populations of 64.4 million people and 66.8 million people, respectively, with Germany's population slightly larger at 80.7 million. Population growth has been relatively flat in the UK (.53%) and France (.41%), with Germany showing slightly negative population growth (-.16%). All three countries, like their western

European neighbors, have been challenged in recent years by the net immigration of people into their countries, placing strains on their social welfare systems. This immigration issue, fostered by the EU's open borders policy, was a pivotal issue in the 2016 vote by UK citizens to withdraw from the EU.

**Table 1**

**Population, Growth Rate and Labor Force by Country  
(2015 estimated)**

<b>Country</b>	<b>Population<sup>1</sup> [in millions] (world rank)</b>	<b>Population<sup>2</sup> Growth Rate (world rank)</b>	<b>Labor Force<sup>3</sup> [in millions] (world rank)</b>	<b>Labor Force as Percentage of Population</b>	<b>Unemployment Rate<sup>4</sup> (world rank<sup>1</sup>)</b>
United Kingdom	64.4 (23)	.53% (157)	32.9 (19)	51.1%	5.4% (58)
Germany	80.7 (19)	-.16% (211)	45.0 (15)	55.8%	4.8% (49)
France	66.8 (22)	.41% (166)	29.8 (20)	44.6%	9.9% (115)

<sup>1</sup><https://www.cia.gov/library/publications/resources/the-world-factbook/rankorder/2119rank.html>

<sup>2</sup><https://www.cia.gov/library/publications/resources/the-world-factbook/rankorder/2002rank.html>

<sup>3</sup><https://www.cia.gov/library/publications/resources/the-world-factbook/rankorder/2095rank.html>

<sup>4</sup><https://www.cia.gov/library/publications/resources/the-world-factbook/rankorder/2129rank.html>

While all three countries are diversified across industry sectors, there are some differences in emphasis and strength. Germany is recognized as the world's largest and most technologically advanced manufacturer of industrial and chemical products (CIA, 2016). They are a major producer of machinery, vehicles, electronics, chemicals and household equipment, with significant investment in the related material industries of steel, iron, coal and cement. In terms of GDP composition by sector (Table 2), Industry represents 30.2 percent of Germany's GDP, as compared to approximately 19 percent of the UK's and France's GDP. The economies of France and the UK are slightly more dependent on the services sector, with financial services an important contributor to the UK economy and tourism a leading industry in France.

Table 2

GDP Composition by Sector of Origin<sup>1</sup> (2015 estimated)

Country	Agriculture <sup>1</sup> percent of Total GDP	Industry percent of Total GDP	Services percent of Total GDP
United Kingdom	0.6%	19.7%	79.6%
Germany	0.7%	30.2%	69.0%
France	1.7%	19.3%	79.0%

<sup>1</sup> <https://www.cia.gov/library/publications/resources/the-world-factbook/geos/uk.html>,  
<https://www.cia.gov/library/publications/resources/the-world-factbook/geos/gm.html>,  
<https://www.cia.gov/library/publications/resources/the-world-factbook/geos/fr.html>

Table 3

## GDP Per Capita by Country (2015 estimated)

Country	GDP Total <sup>1</sup> [in billions US\$] (world rank)	Annual GDP <sup>2</sup> Real Growth Rate <sup>2</sup> (world rank)	Annual GDP <sup>3</sup> Per Capita <sup>3</sup> [in US\$] (world rank)
United Kingdom	2,679.0 (10)	2.20% (131)	41,200 (39)
Germany	3,841.0 (6)	1.50% (153)	46,900 (28)
France	2,647.0 (11)	1.10% (168)	41,200 (38)

<sup>1</sup><https://www.cia.gov/library/publications/resources/the-world-factbook/rankorder/2001rank.html>

<sup>2</sup><https://www.cia.gov/library/publications/resources/the-world-factbook/rankorder/2003rank.html>

<sup>3</sup><https://www.cia.gov/library/publications/resources/the-world-factbook/rankorder/2004rank.html>

All three countries have experienced positive real growth in Gross Domestic Product in recent years, with improvement seen in 2015 over the previous two years. The estimated Annual GDP Real Growth Rate in 2015 was 2.2 percent in the UK, 1.50 percent in Germany and 1.1 percent in France, as shown in Table 3. Germany is known to have a highly skilled labor force, and among the three nations has the highest percentage of its population employed in its labor force at 55.8 percent (as compared to the UK at 51.1 percent and France at 44.6 percent) and the lowest unemployment rate at 4.8 percent (versus 5.5 percent for the UK and 9.9 percent for France), as summarized in Table 1.

The economies of the three countries are highly interdependent, as evidenced by the percentage of imports and exports flowing among them. As shown in Table 4, Germany is the largest import trading partner of France and the UK, providing 19.5 percent and 14.8 percent of imports into those two countries,

respectively. Germany is also a major export trading partner to France and the UK, with 15.9 percent of all of France's exports and 16.1 percent of the UK's exports flowing to Germany. Trade between the UK and France is also significant. Both France and Germany experienced significant trade surpluses in 2015, with France's exports exceeding imports by an estimated \$4,470 billion and Germany's by \$308.1 billion. The UK, by contrast, was a net importer of goods and services, with an estimated trade deficit of \$175.1 billion.

**Table 4**  
**Exports and Imports by Country (2015 estimated)**

Country	EXPORTS			IMPORTS		
	Total <sup>1</sup> [in billions US\$] (world rank)	Major Export Partners	% of Total	Total <sup>2</sup> [in billions US\$] (world rank)	Major Import Partners	% of Total
United Kingdom	442.0 (11)	US Germany Switzerland France	14.6% 16.1% 7.0% 5.9%	617.1 (6)	Germany China US France	14.8% 9.8% 9.2% 5.8%
Germany	1,292.0 (4)	US France UK	9.6% 8.6% 7.5%	983.9 (4)	Netherlands France China UK	13.7% 7.6% 7.3% 4.2%
France	5009.1 (7)	Germany Spain US UK	15.9% 7.3% 7.2% 7.1%	539.0 (7)	Germany Belgium Italy UK	19.5% 10.7% 7.7% 4.3%

<sup>1</sup> <https://www.cia.gov/library/publications/resources/the-world-factbook/rankorder/2078rank.html>

<sup>2</sup> <https://www.cia.gov/library/publications/resources/the-world-factbook/rankorder/2087rank.html>

<sup>3</sup> <https://www.cia.gov/library/publications/resources/the-world-factbook/geos/uk.html>,  
<https://www.cia.gov/library/publications/resources/the-world-factbook/geos/gm.html>,  
<https://www.cia.gov/library/publications/resources/the-world-factbook/geos/fr.html>

### 3. UK, German, and French Accounting Systems

The UK, Germany, and France, as part of the EU, adopted International Financial Reporting Standards (IFRS) in 2002 which became effective for firms preparing financial statements in fiscal year 2005.

The individual national accounting systems of UK, Germany, and France are regulated through The Accounting Act (France) and through Companies Act (United Kingdom, and Germany). Preparation and disclosure of balance sheet and income statement are requirements in all three countries using IFRS. The only

deviation that exists in the preparation of the basic set of financial statements is that the Cash Flow Statement which is required in the UK and Germany is not in France by their law. Despite the fact that preparing cash flow statement is not a legal obligation in France, most French companies prepare and disclose this statement in compliance with recommendation of their National Accounting Board.

The harmonization of accounting standards eliminates the problems faced with the comparability of published financial statements and the individual account balances when different accounting standards are used. Without this harmonization issues such as recognition and measurement, disclosure, and terminology differences could affect the ability to compare the financial ratios of firms across countries.

Since the vote in the UK to leave the EU, experts have considered the effect of this move on accounting standards in the UK and whether the profession would want to withdraw from following IFRS. The opinion at this time is that this is highly unlikely to occur as the current law that regulates UK accounting standards has incorporated IFRS.

### **Methodology and Data**

Multiple Discriminant Analysis - MDA (see, e.g., Altman, 1968; Stevens, 1973; Belkaoui, 1978) and Multivariate Analysis of Variance - MANOVA (see, e.g., Hutchinson et al., 1988; Meric et al., 1991) are the two multivariate techniques most commonly used in previous studies to compare the financial management characteristics of different groups of firms. In this study, we use the MANOVA technique to compare the financial management characteristics of UK manufacturing firms with the financial management characteristics of a combined sample of German, and French manufacturing firms. Detailed information about the MANOVA technique can be found in Marascuilo and Levin (1983) and Johnson and Wichern (2007).

Financial ratios can give an idea about the financial management characteristics of firms. Financial ratios are generally used in empirical studies to compare the financial management characteristics of different groups of firms. The financial ratio data used in this study were obtained from the 2015 year-end financial statements of the firms in the Research Insight/Global Vintage database. Manufacturing industries with SIC codes between 2000-3999 are included in the study. Our research sample consists of 213 UK, 207 German, and 158 French manufacturing firms. We use the financial ratios presented in Table 5 as measures of firm financial management characteristics in the comparisons.

### **MANOVA Tests: UK Manufacturing Firms vs. EU Manufacturing Firms**

Our MANOVA test results comparing the financial management characteristics of UK manufacturing firms and the combined sample of German

and French (heretofore referred to as EU) manufacturing firms are presented in Table 6. The multivariate F-value test statistics in the table indicate that the overall financial management characteristics of UK and EU manufacturing firms are significantly different at the 1-percent level.

The univariate F-value test statistics indicate that there are no statistically significant differences between UK and EU liquidity ratios (i.e., UK and EU financial managers tend to maintain similar levels of liquidity and they have similar liquidity risk).

All three asset management ratios of UK and EU manufacturing firms are significantly different. Average collection period is significantly shorter in UK manufacturing firms than in EU manufacturing firms at the 5-percent level. It implies that UK manufacturing firms have more efficient accounts receivable management compared with EU manufacturing firms. Inventory turnover is significantly higher in UK manufacturing firms than in EU manufacturing firms at the 1-percent level. It implies that UK manufacturing firms have more efficient inventory management compared with EU manufacturing firms. Although average collection period is shorter and inventory turnover is higher in UK manufacturing firms than in EU manufacturing firms, total assets turnover is significantly higher in EU manufacturing firms than in UK manufacturing at the 5-percent level. This implies that EU manufacturing firms may have more efficient fixed assets management compared with UK manufacturing firms.

**Table 5**

**Financial Ratios Used in the Study as Measures  
of Firm Financial Characteristics**

<b>Financial Ratio</b>	<b>Financial Ratio Definition</b>
<b><i>Liquidity</i></b>	
Current Ratio	Current Assets / Current Liabilities
Quick (Acid-Test) Ratio	(Current Assets - Inventories) / Current Liabilities
<b><i>Asset Management</i></b>	
Average Collection Period	Accounts Receivable / Daily Credit Sales
Inventory Turnover	Sales / Inventories
Total Assets Turnover	Sales / Total Assets
<b><i>Financial Leverage</i></b>	
Debt/Equity Ratio	Total Debt / Common Equity
<b><i>Profitability</i></b>	
Net Profit Margin	Net Income / Sales
Return on Assets	Net Income / Total Assets
Return on Equity	Net Income / Common Equity

The univariate test statistics indicate that the most significant difference between UK and EU manufacturing firms is in terms of financial leverage. The Debt/equity ratio is significantly higher in UK manufacturing firms than in EU manufacturing firms at the 1-percent level. It indicates that UK financial managers use more debt-financing, therefore, UK manufacturing firms have greater bankruptcy risk, compared with EU manufacturing firms.

UK manufacturing firms have significantly higher net profit margin compared with EU manufacturing firms at the 10-percent level. This implies that UK manufacturing firm managers are able either to sell their products at higher prices or to achieve lower manufacturing costs compared with their EU counterparts. Because they have higher profit margins, UK manufacturing firms also have higher returns on assets and higher returns on equity compared with EU manufacturing firms.

### Summary and Conclusions

In this study, we compared the financial management characteristics of UK manufacturing firms with the financial management characteristics of EU manufacturing firms (as represented by a combined sample of German and French manufacturing firms) by using financial ratios and the MANOVA (Multivariate Analysis of Variance) technique. Our multivariate test statistics indicate that financial management characteristics of UK and EU manufacturing firms are significantly different.

Our univariate test statistics indicate that UK and EU manufacturing firm managers tend to maintain similar levels of liquidity (i.e., UK and EU manufacturing firms have similar liquidity risk). However, UK manufacturing firm managers tend to use more debt financing compared with EU manufacturing firm managers (i.e., UK manufacturing firms have greater bankruptcy risk compared with EU manufacturing firms).

**Table 6**

#### MANOVA Tests: UK vs. EU

Financial Ratios	Means and Standard Deviations <sup>†</sup>		Univariate Statistics	
	UK	EU	F-Value	P-Value
<i>Liquidity Ratios</i>				
Current Ratio	2.16 (1.34)	2.13 (1.13)	0.06	0.81
Quick (Acid-Test) Ratio	1.46 (1.11)	1.35 (0.94)	1.59	0.21
<i>Asset Management Ratios</i>				
Average Collection Period	69.1 (26.96)	76.1 (43.8)	4.53**	0.03
Inventory Turnover	6.01 (6.65)	4.39 (4.33)	12.4***	0.00
Total Assets Turnover	0.97 (0.46)	1.05 (0.43)	4.44**	0.04



<b>Financial Leverage</b>				
Debt/Equity Ratio	1.82 (1.68)	1.14 (0.93)	38.7***	0.00
<b>Profitability Ratios</b>				
Net Profit Margin	3.73% (12.9%)	2.10% (9.31%)	3.09*	0.08
Return on Assets	3.85% (8.87%)	2.70% (6.90%)	3.05*	0.08
Return on Equity	7.74% (16.3%)	5.65% (14.4%)	2.55	0.11
<b>Multivariate Statistics:</b>			<b>10.7***</b>	<b>0.00</b>

† The figures in parentheses are the standard deviations.

\*\*\*, \*\*, \* indicate that the difference is significant at the 1-percent, 5-percent, and 10-percent levels, respectively.

UK manufacturing firm managers are able to collect their accounts receivable faster and they are able to achieve a higher inventory turnover compared with EU manufacturing firm managers. However, total assets turnover is significantly higher in EU manufacturing firms than in UK manufacturing firms. This implies that EU manufacturing firm managers are able to achieve a more efficient fixed assets management compared with UK manufacturing firm managers.

UK manufacturing firms tend to be more profitable compared with EU manufacturing firms. UK manufacturing firm managers are able to achieve higher profit margins compared with their EU counterparts. This implies that UK manufacturing firms are able either to get higher prices for their products, or to achieve lower manufacturing costs, compared with EU manufacturing firms. UK manufacturing firms are also able to earn higher returns on every dollar invested in total assets and in equity.

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