

Rowan University

## Rowan Digital Works

---

Rohrer College of Business Faculty Scholarship

Rohrer College of Business

---

5-2014

### A comparison of the financial characteristics of U.S. and German manufacturing firms

Daniel Folkinshteyn

*Rowan University*, [folkinshteyn@rowan.edu](mailto:folkinshteyn@rowan.edu)

Ozge Uygur

*Rowan University*, [uygur@rowan.edu](mailto:uygur@rowan.edu)

Gulser Meric

*Rowan University*, [meric@rowan.edu](mailto:meric@rowan.edu)

Follow this and additional works at: [https://rdw.rowan.edu/business\\_facpub](https://rdw.rowan.edu/business_facpub)



Part of the [Finance and Financial Management Commons](#)

Let us know how access to this document benefits you - share your thoughts on our feedback form.

---

#### Recommended Citation

Folkinshteyn, D., Uygur, O., & Meric, G. (2014). A comparison of the financial characteristics of U.S. and German manufacturing firms. *International Journal of Business and Finance Research*, 8(5), 9-22.

This Article is brought to you for free and open access by the Rohrer College of Business at Rowan Digital Works. It has been accepted for inclusion in Rohrer College of Business Faculty Scholarship by an authorized administrator of Rowan Digital Works. For more information, please contact [brush@rowan.edu](mailto:brush@rowan.edu).

# A COMPARISON OF THE FINANCIAL CHARACTERISTICS OF U.S. AND GERMAN MANUFACTURING FIRMS

Daniel Folkinshteyn, Rowan University

Ozge Uygur, Rowan University

Gulser Meric, Rowan University

## ABSTRACT

*The U.S. and Germany rank #1 and #3, respectively, in the world, in terms of the total amount of international trade. U.S. and German firms compete with one another for a larger market share in other countries and in each other's local markets. And yet, there are no published studies that compare the financial management practices of U.S. and German firms. In this paper, we make a contribution to the finance literature on this subject by comparing the financial characteristics of U.S. and German manufacturing firms. Our findings provide valuable insights for corporate financial managers and for investors who invest in these countries. Using a sample of 1166 firms, we find that the financial characteristics of U.S. manufacturing firms differ significantly from those of German manufacturing firms. MANOVA test results indicate that U.S. firms exhibit higher liquidity, lower debt, higher profitability, and lower total assets turnover. These findings are also supported by the logistic regression results. We suggest that better financial performance of U.S. firms could be attributed to more business-friendly employment laws and lower levels of unionization in the United States.*

**JEL:** G30, G31

**KEYWORDS:** Financial Ratios, Manufacturing, United States, Germany, MANOVA

## INTRODUCTION

The U.S. had the largest (\$3,733 billion) and Germany had the third largest (\$2,880 billion) volume of international trade in the world in 2011 (CIA, 2013). There is a stiff competition between U.S. and German firms to capture a larger market share in each other's markets and in other countries. Therefore, comparing the financial characteristics of U.S. and German firms can provide valuable insights for financial managers and for the investors who invest in these countries. However, this subject has not been sufficiently studied. The objective of this study is to compare the financial characteristics of U.S. and German manufacturing firms, and investigate how any differences relate to the economic, legal, and labor environments in the two countries. Using a sample of 1166 firms for 2012, we find that the financial characteristics of U.S. and German manufacturing firms differ significantly along a number of dimensions. We find that U.S. firms exhibit higher liquidity, lower debt, higher profitability, and lower total assets turnover. Our findings are supported by several statistical studies, including univariate and multivariate ANOVA, two-sample t-tests, and logistic regression results. We propose that the generally better financial performance of U.S. firms could be attributed to more business-friendly employment laws and lower levels of unionization in the United States.

Our research contributes to the literature in the following significant ways. It is the first high-level study that compares the financial characteristics and management practices of U.S. and German manufacturing firms. In addition, it provides valuable insights to international investors about investment atmosphere in these countries and to corporate managers for possible mergers, takeovers or other competitive strategies.

The paper is organized as follows. In the next section, we present a brief review of the literature and set the stage for our study with a comparison of the U.S. and German economies. Following, we explain our methodology and data, and discuss our empirical results. In the final section, we conclude the paper and note suggestions for future research.

## LITERATURE REVIEW

Comparing the financial 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 characteristics of bankrupt and non-bankrupt firms. Stevens (1973), Belkaoui (1978), Rege (1984), and Meric et al. (1991) identify the financial characteristics of firms that have been corporate takeover targets by comparing them with firms that have not been targets in corporate takeovers.

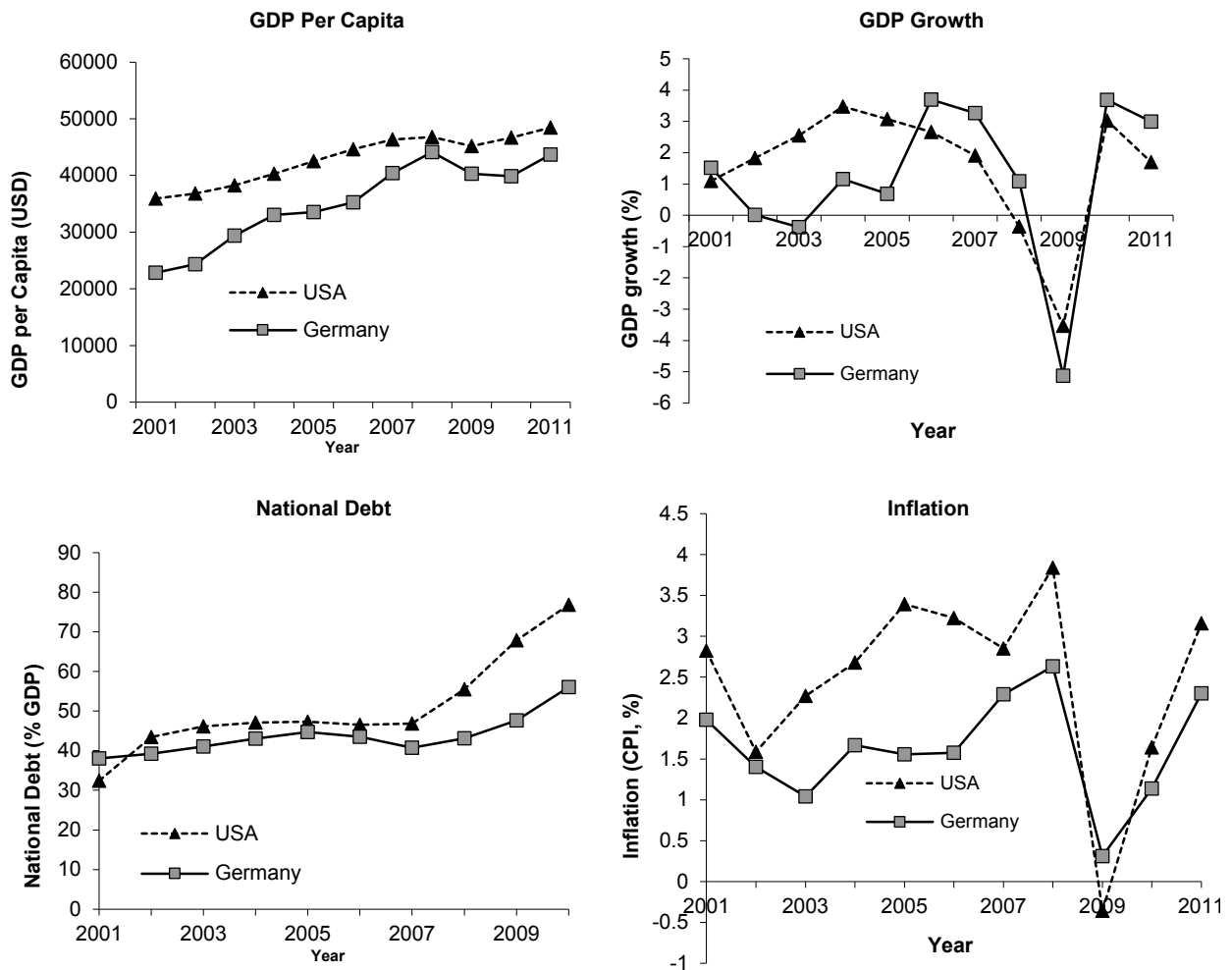
Hutchinson et al. (1988) identify the financial characteristics of firms which achieve stock market quotation by comparing them with firms without stock market quotation. Meric et al. (2000) compare the financial characteristics of Japanese *keiretsu*-affiliated and independent firms to identify the financial characteristics of *keiretsu*-affiliated firms. A number of studies compare the financial characteristics of firms in different countries. For instance, Kester (1986) and Wald (1999) compare the capital and ownership structures of firms in different countries and they find significant differences.

Meric and Meric (1994) find significant differences between the financial characteristics of U.S. and Japanese manufacturing firms. Meric et al. (2002) find significant differences between the financial characteristics of U.S., E.U., and Japanese manufacturing firms. Although both the U.S. and Germany are large and developed economies, there are a number of striking differences between the two countries on a macroeconomic level. The U.S. is a significantly larger economy than Germany, both in terms of GDP (\$15.1 trillion for the U.S. vs. \$3.6 trillion for Germany, as of 2011), and in terms of population (312 million for USA and 82 million for Germany, as of 2011). (These and other demographic and macroeconomic data are obtained from Worldbank (2012), unless otherwise indicated).

As seen in the top left panel of Figure 1, Germany has made significant progress toward catching up with the U.S. on GDP per capita in the past decade. However, looking at the top right panel, we can see that the GDP growth of the two countries has been about the same on average suggesting that most of the progress has been through population growth differential, rather than GDP growth differential. Indeed, looking at the top left panel of Figure 3, it is clear that, although both the German and the U.S. population growth rates have shown a slightly decreasing trend, Germany has started out at approximately zero, and is dipping into the negative territory, while the U.S. population has grown at about 1 percent per year.

In the bottom two panels of Figure 1, we observe that the national debt of the two countries, as a percent of GDP, has been about the same until 2006. However, the U.S. debt has increased sharply after this date. Both countries have a relatively moderate rate of inflation, in the low-single digits. However, there is a consistent pattern of U.S. inflation rate being about one percent higher, with Germany averaging at about 2 percent, while U.S. is flirting with 3 percent. In Figure 2, we present interest rate history and aggregate statistics for the use of funds. In the top left panel, we examine the pattern of interest rates, as measured by yields on 10-year government bonds. Interest rates in the U.S. have been higher than those in Germany for most of the past ten years, however by a smaller margin than the inflation rate differential that we have discussed earlier. This shows that the real cost of funds, net of inflation, has actually been consistently lower in the U.S. On the top right panel of Figure 2, we present the gross savings rate, as a percent of GDP. With a lot of media attention on the “low savings rate” in the U.S., it is no surprise that Germany has a significantly higher, and growing, savings rate over time, increasing from 20 to 25 percent over the past ten years, while the U.S. has a lower, and shrinking, savings rate moving from 15 to about 10 percent over the same period.

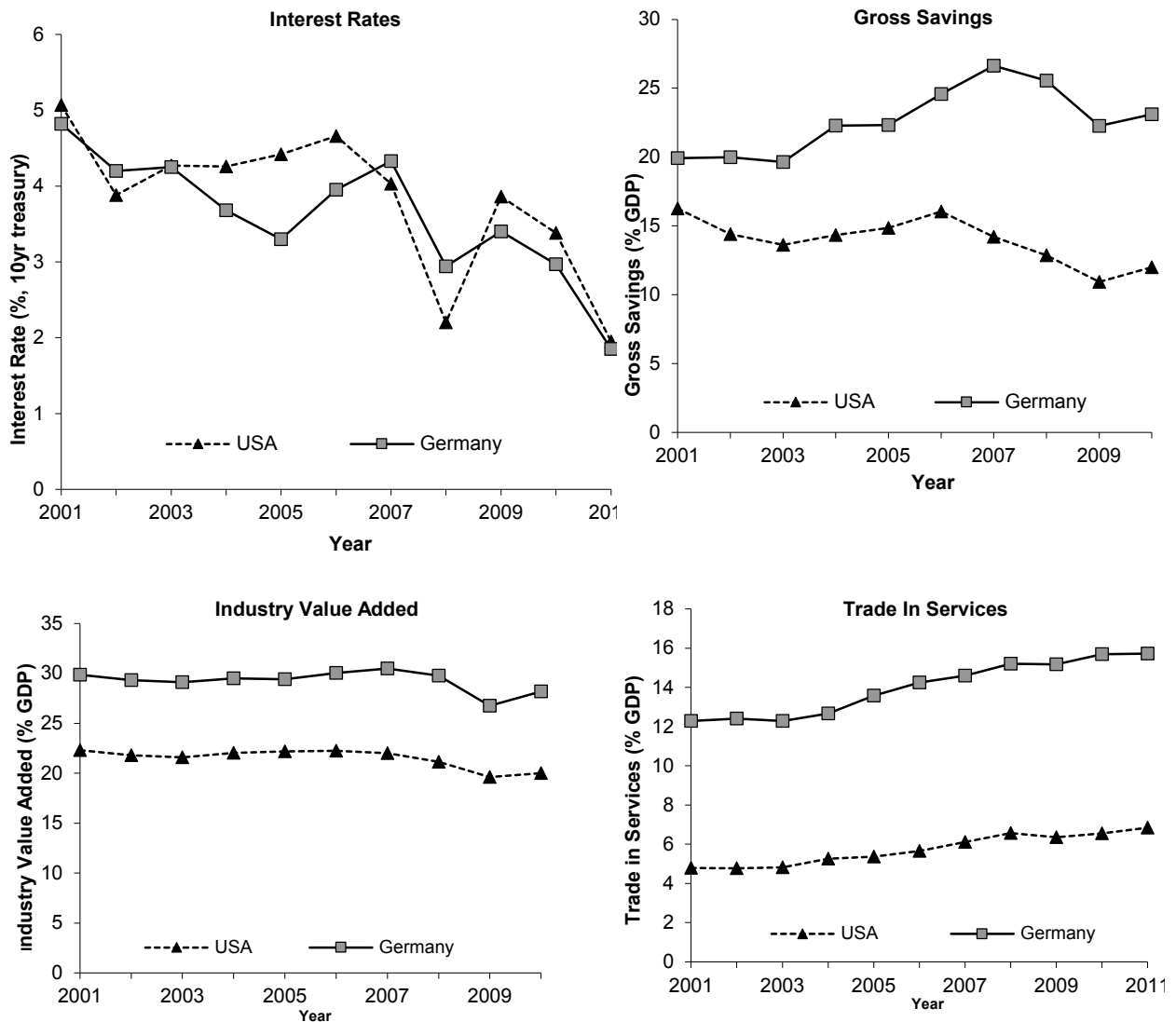
Figure 1: Economic Data



This figure shows several economic data series for U.S. and Germany from 2001 to 2011. Included are GDP per capita, GDP growth rate, national debt as percent of GDP, and inflation rate.

Industry value added statistics, as a percent of GDP, are presented in the bottom left panel of Figure 2. Our data source, the World Bank, measures this variable as value added in mining, manufacturing, construction, electricity, water, and gas, where “value added” is the total output of a sector, net of any intermediate inputs. The value added percentage appears to be substantially higher in Germany than in the U.S. As seen in the bottom right panel of Figure 2, total trade in services, which is the sum of exports and imports of services, is also consistently higher in Germany than in the U.S. as a percent of GDP. Both countries show an increasing trend in international services trade.

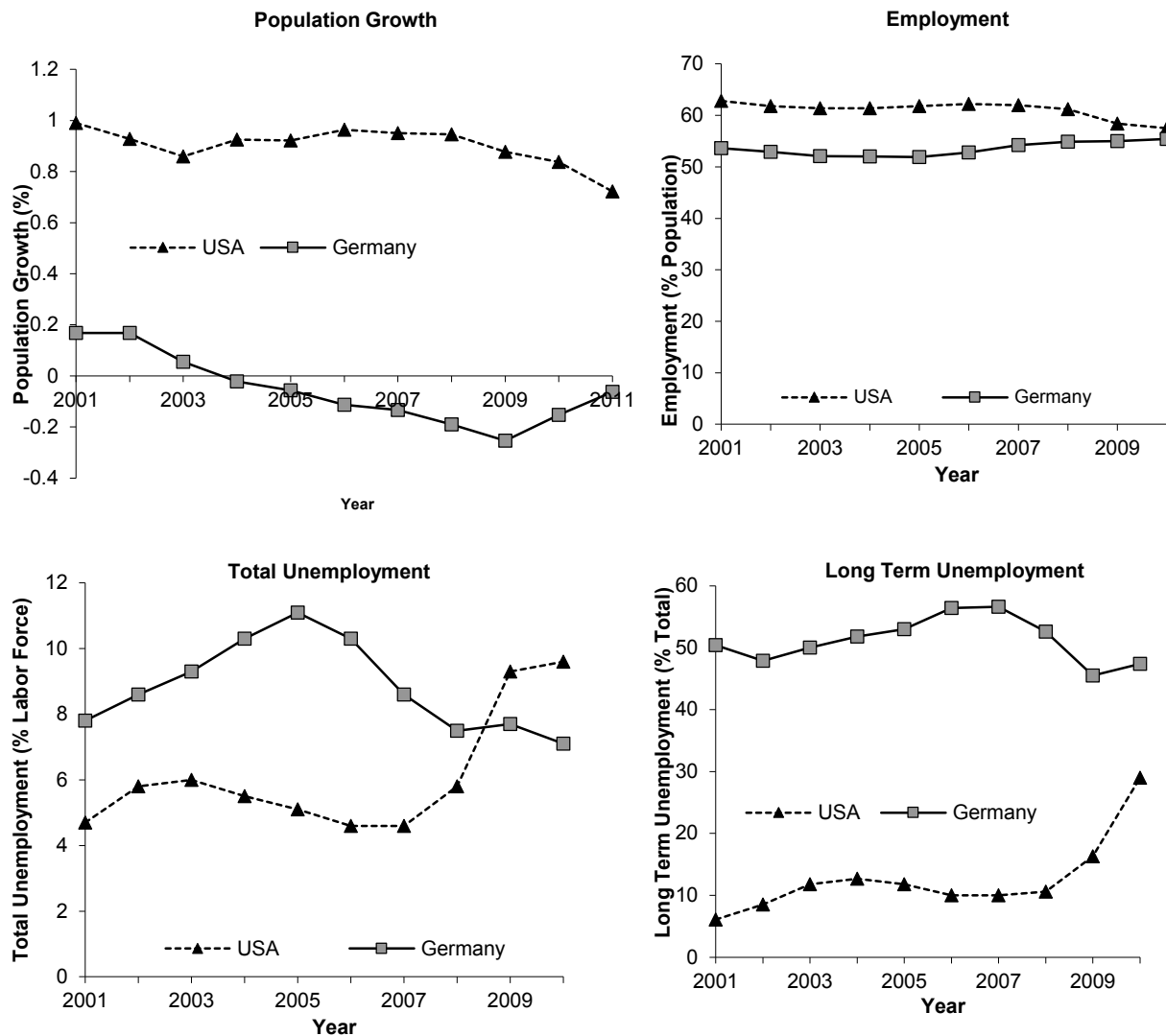
Figure 2: More Economic Data



This figure shows several economic data series for U.S. and Germany from 2001 to 2011. Included are interest rates (yield of 10 year treasuries), gross savings as percent of GDP, industry value added as percent of GDP, and trade in services as percent of GDP.

Figure 3 presents the population and employment statistics. The top right panel shows that total employment (defined as proportion of population over age 15 that is employed) in the U.S. has been consistently higher than in Germany, but they have converged after 2008 due to a sharp increase in the U.S. unemployment rate. As can be seen in the bottom two panels, historically, long-term unemployment rates are higher in Germany than in the U.S. However, total unemployment rate has increased dramatically in the U.S. after 2008.

Figure 3: Employment and Demographics

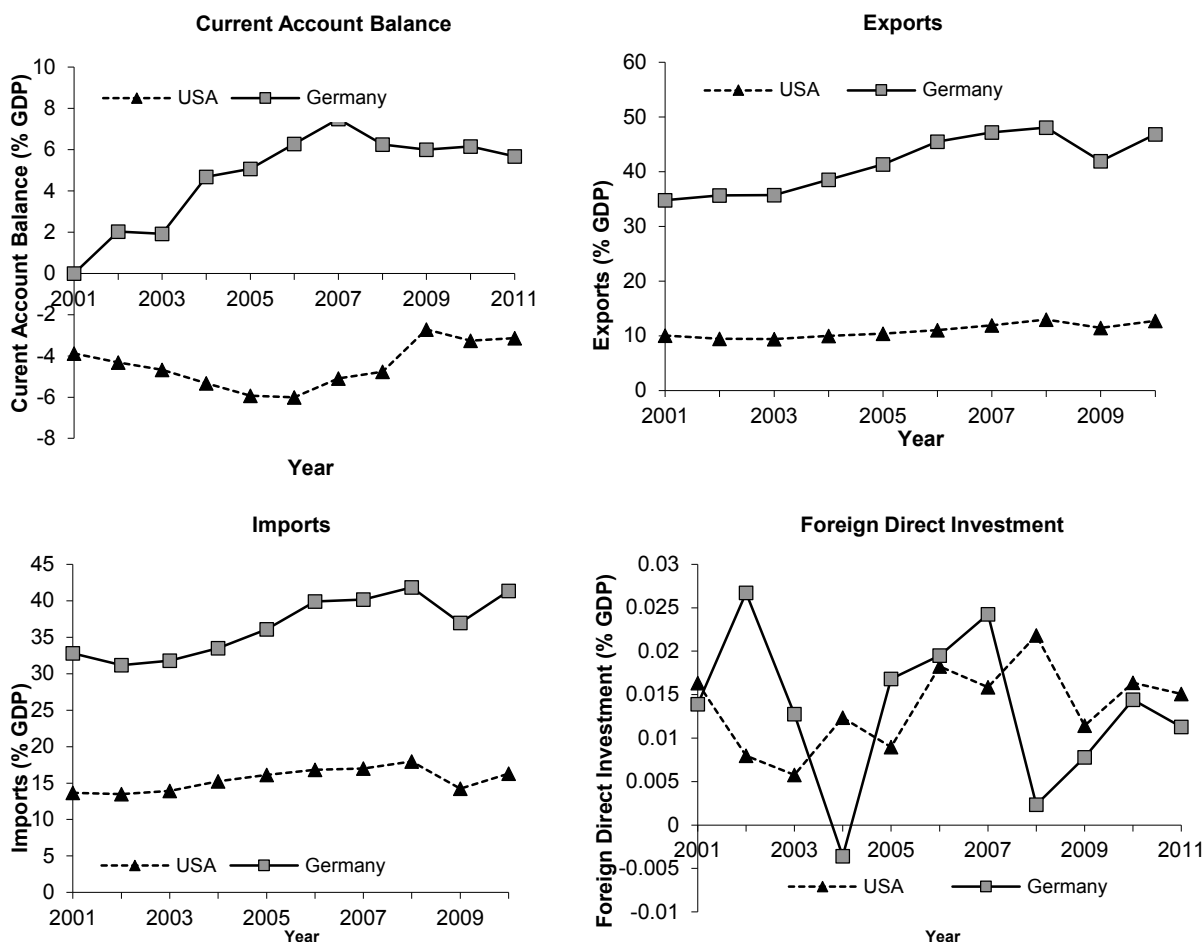


This figure shows employment and demographics data series for U.S. and Germany from 2001 to 2011. Included are population growth, employment as percent of population, total unemployment as percent of labor force, and long term unemployment as percent of total unemployment.

Another interesting statistic to examine is the GINI coefficient, which is a measure of income distribution inequality, ranging from 0 (perfect equality) to 100 (perfect inequality). Since 2000, the U.S. has had considerably greater income inequality compared with Germany, with the average GINI coefficient being 28.31 for Germany and 40.81 for the U.S. The GINI coefficient was 27 for Germany in 2006 and 45 for the U.S. in 2007. (CIA, 2012) The top left panel of Figure 4 shows the trend in the current account balance as a percent of GDP. Germany has consistently been in the positive territory here, with a marked increase from 2001 to 2006. The U.S. has had a stable deficit of about 5% during the 2001-2010 period. The top right and bottom left panels show that Germany is much more reliant on international trade overall, and has become increasingly more so over the past decade – latest figures indicate that total exports and imports are 50 and 45 percent of GDP, respectively, for Germany. In contrast, the U.S. is much more self-sufficient with both imports and exports being about 10-15% of GDP. Unlike Germany, U.S. imports have been consistently larger than exports, resulting in the negative current account balance as shown in the first panel. Finally, the bottom right panel shows the trend in foreign direct investment (FDI) for the two countries, defined as

net inflows of investment to acquire a lasting management interest of 10 percent or more of the voting stock. Although there is considerable variability in FDI over time, both U.S. and Germany appears to have similar inflows (as a percent of GDP) of about 1-2% per year.

Figure 4: International Trade



This figure shows several international trade data series for U.S. and Germany from 2001 to 2011. Included are current account balance as percent of GDP, exports as percent of GDP, imports as percent of GDP, and foreign direct investment as percent of GDP.

There are also significant differences in labor and employment laws and environment between Germany and the U.S. While in the U.S. the prevailing paradigm is “employment at will”, wherein both parties (employer and employee) can terminate the relationship at any time for any reason, in Germany the standard employment contract is for an unlimited period, and can only be terminated for certain reasons and with statutory notice periods (Jung 2011). The notice period is at a minimum of one month for both employer and employee, but goes up for the employer with employee tenure, up to 7 months maximum for an employee with 20 year tenure. Termination with notice can occur for personal, conduct, and business reasons, while termination without notice is only allowed in cases of serious misconduct (NRW.INVEST, n.d. 2012). Under certain limited circumstances, employment contracts can be specified for fixed term, such as for temporary project work. Furthermore, the law requires the employer to let a full time employee work part time, and to give preference to part time employees when seeking to fill full-time positions. Collective bargaining agreements can supersede statutory requirements. While union membership rates in the U.S. have fallen gradually from 14.7 percent in 2001 to 13 percent in 2011 (Bureau of Labor Statistics, 2012),

Germany has had a consistently higher union participation rate, 19% as of 2010 (Fulton, 2011). Germany's corporate tax rate is generally lower than that nominally faced by U.S. corporations, with average rate of just under 30% as of 2010 (NRW.INVEST, n.d. 2013), composed of the federal corporate income tax and the trade tax levied by municipalities.

The federal tax is a flat 15.825 percent, while the local trade taxes can vary from 7 to 17 percent. In comparison, U.S. federal tax varies from 15 to 39 percent, while state taxes range from 0 to 12 percent, and averaged in 2010 to about 39 percent. According to the U.S. Department of State, as of 2011, Germany is the fifth largest trading partner of the U.S., and the top importer of U.S. goods in the EU. Conversely, the U.S. is Germany's second largest export market, and first outside the EU. Total bilateral goods trade was \$146 billion, with \$97 billion imported from Germany into the U.S., and \$49 billion from the U.S. into Germany (Bureau of European and Eurasian Affairs, 2012). As of 2011, the top five categories of goods imported by the U.S. from Germany are passenger vehicles (19.9%), medicinal, dental, and pharmaceutical preparations (9.2%), industrial machinery (5.0%), parts and accessories (4.9%), and scientific, medical and hospital equipment (4.7%) (United States Census Bureau, 2012). The top 5 categories of exports from the U.S. to Germany are passenger vehicles (11.4%), civilian aircraft, engines, equipment, and parts (11.0%), pharmaceutical preparations (5.4%), medical equipment (5.0%), and industrial machines (4.0%) (United States Census Bureau, 2012). It is apparent that there is large overlap in the broad classes of goods produced for export in the two countries.

The above information suggests a number of possible inferences about the cross-sectional variation in the financial characteristics of manufacturing firms between the U.S. and Germany. Germany relies, to a much greater degree than the U.S., on international markets, likely with significant weight on the Eurozone, which suggests both that German manufacturing firms may have an easier time finding demand for their products and that they face greater competition from foreign imports. The positive current account balance suggests that the former may be more likely as a net result. Further, the generally more stable economic environment in Germany, with more stable and lower inflation, and lower national debt, might be beneficial to the business environment in the country overall.

Due to Germany's labor law environment and higher level of unionization, we might expect lower profitability for German firms due to higher employee costs. However, smaller income inequality in Germany, which may result in greater consumer spending on manufactured goods, and the generally lower corporate tax burden, might both suggest higher profitability ratios for German firms. Additionally, more rigid employment laws, which among other things, make it harder to terminate employees and mandate generous severance benefits, as well as union presence on corporate boards, might suggest that German firms would have a harder time increasing production automation, thus pushing firms to rely less on fixed capital and more on labor, resulting in higher total assets turnover.

According to ECB statistics, the level of indebtedness of nonfinancial firms is quite similar in the U.S. and the Euro zone (European Central Bank, 2012). However, empirical studies show that German firms have significantly higher debt ratios compared with firms in other EU countries (Meric, et al., 2013). Meric, et al. (2013) argue that, despite economic integration, differences in country business traditions persist in the E.U. (e.g., German firms traditionally use more financial leverage compared with other EU countries). German bankruptcy law is generally less benevolent to firm management than that in the US, and is relatively more creditor-friendly (American Bankruptcy Institute, 2004). However, empirical data suggests that in Germany shareholders fare better than those of the U.S., and that there are fewer bankruptcy filings (Vladimirov, 2009). In addition, with the real cost of funds having been lower in the U.S. than Germany in the past decade, as discussed above, we might expect German firms to have lower debt levels to avoid bankruptcy. Moreover, lower German tax rates mean a reduced interest tax shield as compared to the U.S., which might serve as yet another factor to make debt less attractive to German firms and lower average indebtedness. However, other institutional or cultural factors may influence firm characteristics in



unexpected ways, so ultimately the question of the presence and direction of differences in firm financial characteristics between the two countries remains an empirical one.

## 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, 1997) are two multivariate techniques most commonly used in previous studies to compare the financial characteristics of different groups of firms. In this study, we use the MANOVA technique to compare the financial characteristics of U.S. and German manufacturing firms. Detailed information about the MANOVA methodology can be found in Marascuilo and Levin (1983) and Johnson and Wichern (2007). Financial ratios are generally used in empirical studies to compare the financial characteristics of different groups of firms. Our financial ratio data were obtained from the Research Insight/Global Vintage database in September 2012, and include a snapshot of the most recent available data at the time of retrieval. Manufacturing industries with SIC codes between 2000-3999 are included in the study. Our research sample consists of 909 U.S and 257 German manufacturing firms with no missing financial data in the database. We use the financial ratios presented in Table 1 in the comparisons of firm financial characteristics in the two countries. To disentangle the significance of the individual ratios, we also use univariate ANOVA and T test analyses, as well as a multivariate logistic regression with the firm's country being the dependent classification variable and firm financial characteristics serving as predictors.

Table 1: Financial Ratios Used in the Study as Measures of Firm Financial Characteristics

Financial Ratio Name	Financial Ratio Definition
<i>Liquidity</i>	
Current Ratio (CR)	Current Assets / Current Liabilities
Quick Ratio (QR)	(Current Assets - Inventories) / Current Liabilities
<i>Asset Management (Turnover) Ratios</i>	
Accounts Receivable Turnover (ART)	Sales / Accounts Receivable
Inventory Turnover (INT)	Sales / Inventory
Fixed Assets Turnover (FAT)	Sales / Net Fixed Assets
Total Assets Turnover (TAT)	Sales / Total Assets
<i>Financial Leverage</i>	
Equity Ratio (ER)	Common Equity/Total Liabilities
<i>Profitability</i>	
<i>Net Profit Margin (NPM)</i>	<i>Net Income / Sales</i>
<i>Return on Assets (ROA)</i>	<i>Net Income / Total Assets</i>
<i>Return on Equity (ROE)</i>	<i>Net Income / Common Equity</i>
<i>Growth</i>	
Annual Sales Growth Rate (ASGR)	Average Sales Growth for the Last Three Years

*This table lists and defines the financial ratios that we use in our analysis. Included are ratios for liquidity, asset turnover, leverage, profitability, and growth.*

## RESULTS AND DISCUSSION

Our MANOVA test results are presented in Table 2. The multivariate test statistics in the table indicate that the overall financial characteristics of U.S. and German manufacturing firms are significantly different at the 1-percent level. The univariate test statistics in Table 2 show that the liquidity ratios of U.S. manufacturing firms are significantly higher than those of German manufacturing firms at the 1-percent level. These results indicate that U.S. manufacturing firms have less technical insolvency risk compared with German manufacturing firms (i.e., U.S. manufacturing firms are better able to meet their maturing obligations compared with their German counterparts). This difference could be attributable to better

corporate governance in the U.S. markets – if expropriation is less of a threat, U.S. firms may keep more liquid assets. There appear to be no significant differences between the two groups of firms in terms of the accounts receivable turnover, inventory turnover, and fixed assets turnover ratios. The mean total assets turnover ratio of U.S. manufacturing firms, however, is significantly lower than that of German manufacturing firms at the 1-percent level. German manufacturing firms appear to have more efficient total assets management compared with their U.S. counterparts. It is also possible that rigid employment laws which make it difficult to terminate employees, as well as union presence on corporate boards, might make it difficult for German firms to increase production automation; by relying less on fixed capital and more on labor, German firms would exhibit higher total assets turnover.

Table 2: MANOVA Statistics: U.S. Vs. Germany

<b>Panel 1: Univariate Statistics</b>				
<b>Financial Ratio</b>	<b>United States</b>	<b>Mean and SD Germany</b>	<b>F Value</b>	<b>P Value</b>
<b>Liquidity</b>				
Current Ratio	3.324 (2.540)	2.378 (2.141)	29.612***	0.000
Quick Ratio	2.231 (2.245)	1.417 (1.265)	30.873***	0.000
<b>Asset Management (Turnover) Ratios</b>				
Accounts Receivable Turnover	8.933 (8.399)	8.022 (8.540)	2.334	0.127
Inventory Turnover	6.066 (6.752)	5.832 (13.411)	0.146	0.703
Fixed Assets Turnover	10.160 (14.545)	8.605 (13.492)	2.357	0.125
Total Assets Turnover	1.100 (0.527)	1.200 (0.571)	6.896***	0.009
<b>Financial Leverage</b>				
Common Equity/Total Liabilities	2.261 (2.716)	1.314 (1.590)	28.356***	0.000
<b>Profitability</b>				
Net Profit Margin	6.060% (10.062%)	3.910% (7.723%)	10.021***	0.002
Return on Assets	5.433% (8.567%)	4.333% (6.889%)	3.567*	0.059
Return on Equity	12.966% (25.786%)	8.772% (15.493%)	6.146**	0.013
<b>Growth</b>				
Annual Sales Growth Rate	4.551% (12.466%)	5.173% (22.237%)	0.337	0.562
<b>Panel 2: Multivariate Statistics</b>				
<b>MANOVA:</b>			5.451***	0.001

Panel 1 shows the univariate ANOVA results for each of the financial ratios defined above in Table 1. For each ratio we show the sample means for U.S. and Germany, with standard deviations in parentheses, the F statistic, and the p value. Panel 2 shows the MANOVA result for all ratios, with F statistic and p-value. \*\*\*, \*\*, \* indicate significance at the 1, 5, and 10 percent levels, respectively.

The mean equity ratio is significantly higher in U.S. manufacturing firms than in German manufacturing firms. This result indicates that German manufacturing firms use less equity financing (i.e., more debt financing) compared with U.S. manufacturing firms. It implies that German manufacturing firms have

significantly higher bankruptcy risk compared with their U.S. counterparts. On the other hand, this result also means that U.S. firms rely more on equity financing, which introduces a different type of risk. This is valuable information for international investors, especially for those who are concerned about the level and the type of risks they undertake. The univariate test statistics indicate that the profitability ratios of U.S. manufacturing firms are significantly higher than those of German manufacturing firms. The difference is particularly pronounced in terms of the net profit margin ratio. U.S. manufacturing firms appear to be superior to German manufacturing firms in terms of product pricing and/or manufacturing cost control. This finding might be attributable to higher labor costs due to more restrictive labor laws and higher levels of unionization in Germany. The difference between U.S. and German manufacturing firms is not statistically significant in terms of the annual average sales growth rate. Our univariate ANOVA results are confirmed with the Welch two-sample t-tests shown in Table 3, which exhibit the same pattern of significance for the differences between U.S. and German firm financial ratios.

Table 3: Univariate T-Tests: U.S. vs. Germany

Financial Ratio	Mean (USA)	Mean (Germany)	T Value	P Value
CR	3.324	2.378	5.986***	0.0000
QR	2.231	1.417	7.494***	0.0000
ART	8.934	8.022	1.513	0.1309
INT	6.067	5.832	0.2698	0.7875
FAT	10.161	8.605	1.601	0.1100
TAT	1.100	1.200	-2.512**	0.0125
ER	2.261	1.314	7.058***	0.0000
NPM	6.060	3.910	3.664***	0.0003
ROA	5.433	4.333	2.132**	0.0335
ROE	12.966	8.772	3.247***	0.0012
SGR	4.551	5.173	-0.4292	0.6680

*This table shows the univariate T test results for each of the financial ratios used in this study. For each ratio we show the sample means for U.S. and Germany, the T statistic, and the p value. \*\*\*, \*\*, \* indicate significance at the 1, 5, and 10 percent levels, respectively.*

To examine our results in a multivariate context, which allows us to observe the impact and significance of individual variables, we employ the logistic regression as a classification tool. We use the firms' country of origin as a binary response variable (U.S. firms coded as 1), and our collection of financial ratios as regressors, as shown in Equation (1).

$$Country = \alpha_0 + \alpha_1 CR + \alpha_2 QR + \alpha_3 ART + \alpha_4 INT + \alpha_5 FAT + \alpha_6 TAT + \alpha_7 ER + \alpha_8 NPM + \alpha_9 ROA + \alpha_{10} ROE + \alpha_{11} SGR + \varepsilon \tag{1}$$

From the results, shown in Table 4, we observe that the most significant differences show up in the profitability measures, net profit margin, ROE, and ROA. Additionally, the equity ratio and the accounts receivable ratio are significant at the 5% level. The current and quick ratios lose significance in this multivariate setting (quick ratio retains a marginal significance at 10% level), likely because they have a relatively high correlation with each other. These results are in line with earlier statistical tests.

Table 4: Logistic Regression

	Estimate	SE	z-value	p-value
(Intercept)	0.1457	0.2681	0.5436	0.5867
CR	0.0058	0.1350	0.0427	0.9660
QR	0.2987	0.1774	1.684	0.0922*
ART	0.0308	0.0143	2.156	0.0311**
INT	0.0090	0.0113	0.7922	0.4282
FAT	0.0091	0.0073	1.246	0.2127
TAT	-0.1335	0.1718	-0.7774	0.4369
ER	0.1769	0.0835	2.118	0.0342**
NPM	0.0631	0.0202	3.129	0.0018***
ROA	-0.1127	0.0306	-3.684	0.0002***
ROE	0.0319	0.0100	3.193	0.0014***
SGR	-0.0055	0.0048	-1.141	0.2540
AIC				1160.1
pseudo-R <sup>2</sup>				0.115

*This table shows the results of a logistic regression, with firm nationality as the response variable (set to 1 for U.S. firms), and all ratios used as additive independent variables. The ratios are as defined above. For each ratio, we show the coefficient estimate, the standard error, the z-value, and the p-value. \*\*\*, \*\*, \* indicate significance at the 1, 5, and 10 percent levels, respectively.*

## SUMMARY AND CONCLUSIONS

The U.S. and Germany have the first and third largest volume of international trade in the world, respectively. U.S. and German firms have a fierce competition for a larger market share in each other's local markets and in the world's other markets. Therefore, a comparison of the financial characteristics of U.S. and German manufacturing corporations would be of interest to both corporate managers and global investors. In this study, we compare the financial characteristics of U.S. and German manufacturing firms with the MANOVA and logistic regression statistical techniques. Our multivariate test statistics indicate that the overall financial characteristics of manufacturing corporations in the two countries are significantly different. We find that U.S. firms have significantly lower total assets turnover and debt ratios and higher profitability ratios compared with German firms.

The significant differences between the two countries in terms of total assets turnover and profitability may be due to the differences in legal regime and labor environment. German law, which is extremely protective of employee rights, also means higher labor costs and lower profitability. The higher level of unionization in Germany provides additional impetus for this observation. This may also lead to German firms holding fewer assets, using more labor in the capital-labor production mix, and thus exhibiting a higher asset turnover. Our findings on the relative indebtedness of firms in the two countries are surprising. With German bankruptcy laws being less favorable to management, the country's higher real cost of funds, and lower tax rates, we would have expected higher debt ratios in U.S. than Germany, whereas our results show that the opposite is the case. We have several hypotheses that could explain this finding. First, there could be historical/cultural factors that encourage German firms to take on more debt. Further, there could be a difference in the industry mix in our data set between U.S. and Germany that introduces this difference. Additionally, the lower debt load of U.S. firms could be explained by a lower cost of equity in the country. We think these would serve as productive avenues for future studies.

U.S. manufacturing firms, with their high liquidity, lower debt and higher profitability, seem very appealing for the international investor. On the other hand, Germany's positive current account balance, higher savings rates, steadier and lower inflation rate, lower national debt, and lower degree of income inequality, present Germany as more stable and attractive market for investors. It seems that Germany may be a good market for product export, while the U.S. is a better market for direct investment, where manufacturing industries are concerned. The high-level analysis in this study should be of benefit to international investors in these

countries and to corporate managers for possible mergers, takeovers or other competitive strategies. The present research exhibits several limitations. First, our data set does not contain industry information. Since manufacturing firms encompass a number of different industries, so it would likely be illuminating to break down the results by industry. Further, we also do not have time-series data for the firms in question, but only a one-year snapshot in 2012. We think it would be interesting to expand on our results in a longitudinal setting. Investigating these issues in greater detail should be fertile ground for future research.

## REFERENCES

- Altman, E. I. 1968. Financial Ratios, Discriminant Analysis, and the Prediction of Corporate Bankruptcy. *Journal of Finance*, 23 (4): 589-609.
- American Bankruptcy Institute, 2004. Basic Provisions of German Insolvency Law. 1 (3). Retrieved November 29, 2012 from <http://www.abiworld.org/committees/newsletters/international/vol1num3/ReorgEuroUnion1.pdf>
- Beaver, W. H. 1968. Alternative Financial Ratios as Predictors of Failure. *Accounting Review*, 43 (1): 113-122.
- Belkaoui, A. 1978. Financial Ratios as Predictors of Canadian Takeovers. *Journal of Business Finance and Accounting*, 5 (1): 93-108.
- Bureau of European and Eurasian Affairs. 2012. U.S. Relations with Germany. *U.S. Department of State*. Retrieved November 29, 2012, from <http://www.state.gov/r/pa/ei/bgn/3997.htm>
- Bureau of Labor Statistics of the U.S., Department of Labor. 2012. <http://www.bls.gov/webapps/legacy/cpslutab1.htm>
- CIA. The World Factbook. Retrieved November 29, 2012. <https://www.cia.gov/library/publications/the-world-factbook/fields/2172.html>
- CIA. The World Factbook. Retrieved January 9, 2013, from <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2087rank.html> and <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2078rank.html>
- Dambolena, I. G., and Khoury, S. J. 1980. Ratio Stability and Corporate Failure. *Journal of Finance*, 35 (4): 1017-1026.
- Deakin, E. B. 1972. A Discriminant Analysis of Predictors of Business failure. *Journal of Accounting Research*, 10 (1): 167-179.
- Edmister, R. O. 1972. An Empirical Test of Financial Ratio Analysis for Small Business Failure Prediction. *Journal of Financial and Quantitative Analysis*, 7 (2): 1477-1493.
- European Central Bank. 2012. Corporate Indebtedness in the Euro Area. Monthly Bulletin, February 2012. Retrieved November 29, 2012, from [http://www.ecb.int/pub/pdf/other/art2\\_mb201202en\\_pp87-103en.pdf](http://www.ecb.int/pub/pdf/other/art2_mb201202en_pp87-103en.pdf)
- Fulton, L. 2011. Worker representation in Europe. Labour Research Department and ETUI (online publication). Retrieved November 29, 2012, from <http://www.worker-participation.eu/National-Industrial-Relations/Across-Europe/Trade-Unions2>

- Hutchinson, P., Meric, I., and Meric, G. 1988. The Financial Characteristics of Small Firms which Achieve Quotation on the UK Unlisted Securities Market. *Journal of Business Finance and Accounting*, 15 (1): 9-19.
- Johnson, R. D., and Wichern, D. W. 2007. *Applied Multivariate Statistical Analysis*, 6<sup>th</sup> ed. Englewood Cliffs, NJ: Prentice Hall.
- Jung, L. 2011. National Labour Law Profile: Federal Republic of Germany. *International Labor Organization*. Retrieved November 29, 2012, from [http://www.ilo.org/ifpdial/information-resources/national-labour-law-profiles/WCMS\\_158899/lang--en/index.htm](http://www.ilo.org/ifpdial/information-resources/national-labour-law-profiles/WCMS_158899/lang--en/index.htm)
- Kester, W. C. 1986. Capital and Ownership Structure: A Comparison of United States and Japanese Manufacturing Firms. *Financial Management*, 15 (1): 5-16.
- Marascuilo, L. A., and Levin, J. R. 1983. *Multivariate Statistics in the Social Sciences*. Monterey, California: Brooks/Cole Publishing Company.
- Meric, G., Kyj, L., Welch, C., and Meric, I. 2000. A Comparison of the Financial Characteristics of Japanese Keiretsu-Affiliated and Independent Firms. *Multinational Business Review*, 8 (2): 26-30.
- Meric, G., Leveen, S. S., and Meric, I. 1991. The Financial Characteristics of Commercial Banks Involved in Interstate Acquisitions. *Financial Review*, 26 (1): 75-90.
- Meric, I., Dunne, K., Smeltz, W., and Meric, G. 2013. A Comparison of the Financial Characteristics of German and French Manufacturing Firms. *Accounting and Finance Research*, 2 (1): 32-39.
- Meric, I., and Meric G. 1994. A Comparison of the Financial Characteristics of United States and Japanese Manufacturing Firms. *Global Finance Journal*, 5 (1): 205-218.
- Meric, I., Ross, L., Weidman, S., and Meric, G. 1997. A Comparison of the Financial Characteristics of U.S. and Japanese Chemical Firms. *Multinational Business Review*, 5 (2): 23-27.
- Meric, I., Weidman, S. M., Welsh, C. N., and Meric, G. 2002. A Comparison of the Financial Characteristics of U.S., E.U., and Japanese Manufacturing Firms. *American Business Review*, 20 (2): 119-125.
- Moyer, R. C. 1977. Forecasting Financial Failure: A Re-examination. *Financial Management*, 6 (1): 11-17.
- NRW.INVEST, n.d. 2012. Termination of Employment. Retrieved November 29, 2012, from [http://www.nrwinvest.com/Business\\_Guide\\_englisch/Employees\\_and\\_social\\_security/Termination\\_of\\_Employment1/index.php](http://www.nrwinvest.com/Business_Guide_englisch/Employees_and_social_security/Termination_of_Employment1/index.php)
- NRW.INVEST, n.d. 2013. Company Taxation. Retrieved June 15, 2013, from [http://www.nrwinvest.com/Business\\_Guide\\_englisch/The\\_tax\\_system/Company\\_Taxation1/index.php](http://www.nrwinvest.com/Business_Guide_englisch/The_tax_system/Company_Taxation1/index.php)
- Rege, U. P. 1984. Accounting Ratios to Locate Take-over Targets. *Journal of Business Finance and Accounting*, 11 (3): 301-311.
- Stevens, D. L. 1973. Financial Characteristics of Merged Firms: A Multivariate Analysis. *Journal of Financial and Quantitative Analysis*, 8 (2): 149-158.

United States Census Bureau. 2012. <http://www.census.gov/foreign-trade/statistics/product/enduse/imports/c4280.html>

Vladimirov, V. 2009. Soft vs. Tough Bankruptcy Law: Evidence from the U.S. and Germany. *European Finance Association conference proceedings*.

Wald, J. K. 1999. How Firm Characteristics Affect Capital Structure: An International Comparison. *Journal of Financial Research*, 22 (2): 161-187.

Worldbank. 2012. <http://data.worldbank.org>

## **ACKNOWLEDGEMENTS**

We would like to thank the journal editors, two anonymous referees, and participants at the Global Conference on Business and Finance for their helpful comments. Any errors or omissions are our responsibility.

## **BIOGRAPHY**

Dr. Daniel Folkinshteyn is an Assistant Professor of Finance at Rowan University. He can be contacted at 201 Mullica Hill Road, Glassboro, NJ 08028. Phone: 856-256-3038. Email: folkinshteyn@rowan.edu.

Dr. Ozge Uygur is an Assistant Professor of Finance at Rowan University. She can be contacted at 201 Mullica Hill Road, Glassboro, NJ 08028. Phone: 856-256-3478. Email: uygur@rowan.edu.

Dr. Gulser Meric is a Professor of Finance at Rowan University. She can be contacted at 201 Mullica Hill Road, Glassboro, NJ 08028. Phone: 856-256-4038. Email: meric@rowan.edu.