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Net Operating Working Capital and Firm Value: A Cross-Country Analysis

Autores

Sonia Baños-Caballero

Universidad de Murcia

Pedro Juan García-Teruel

Universidad de Murcia

Pedro Martínez-Solano

Universidad de Murcia

(*) ESTE TRABAJO OBTUVO UN ACCESIT EN 2016

**PREMIOS DE INVESTIGACIÓN Y ESTUDIO
ANTONIO DIONIS SOLER 2016**

ISBN: 978-84-617-8575-9
Edita: Fundación Estudios Financieros



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Sonia Baños-Caballero
Universidad de Murcia

Pedro Juan García-Teruel
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Pedro Martínez-Solano
Universidad de Murcia

ABSTRACT

This paper uses a sample of firms from 30 countries during the period 1995-2013 to examine the relation between net operating working capital (NWC) and firm value. While previous studies have examined this relation for firms within a single country, this study shows that the value of NWC varies across countries and that it depends on both investor protection and a country's financial and economic development. Our findings imply that shareholders value NWC more in countries with strong enforcement of investor rights and in countries that are more financially developed. In contrast, the value of NWC is lower in countries with strong creditor rights and high economic development.

JEL classification: G15; G18; G31; G32.

KEYWORDS: Net operating working capital, market value, investor protection, financial development, economic development.

ACKNOWLEDGEMENT: This work was supported by the Spanish Ministry of Economy and Competitiveness (project number ECO2013-47486-P); and the Fundación CajaMurcia.



1. INTRODUCTION

Many corporate financial executives believe that working capital management is an important determinant of firm value (Kieschnick et al., 2013). This is because net operating working capital (defined as the sum of accounts receivable and inventories net of accounts payable) represents a substantial portion of firms' total assets (in our sample this ranges from an average of 10.4% for Canada to 29.7% for the Netherlands). Although the net investment in operating working capital (NWC) depends on the management of a firm's accounts receivable, inventories, and accounts payable, previous research has demonstrated the convenience of managing operating assets and liabilities jointly rather than individually (see, for example, Sartoris and Hill, 1983; Hill et al., 2010).

Research has attempted to analyze the relation between working capital management and a firm's value (Kieschnick et al. 2013; and Baños et al., 2014). These studies examine firms in single countries, the United States and the United Kingdom, respectively. They find evidence of the linkage between working capital management and firm value, and they demonstrate that the value of NWC is influenced by some firm characteristics, such as future sales expectations, financial constraints and bankruptcy risk. However, we know of no published empirical research on the differences in valuation of NWC across countries. As La Porta et al. (1998) indicate, the extent to which agency problems between corporate insiders (managers and controlling shareholders) and outsiders (minority shareholders and creditors) can be mitigated depends on both the content of the laws and the quality of their enforcement. Thus, the value of NWC may depend on investor protection. Indeed, NWC is more easily converted into cash compared to other assets. Indeed, Fazzari and Petersen (1993) indicate that this investment can act as a stock of precautionary liquidity in case of future cash shortfalls. Wu et al. (2012) also support this idea by demonstrating that trade receivables and cash are substitutes. In this situation, better investor protection can reduce the expropriation of outsiders by insiders, making it more difficult for the latter to convert part of NWC into private benefits that increase their own welfare. In addition to the ease with which insiders can expropriate wealth, the likelihood that creditors take control of a firm in the case of financial distress, as well as a firm's access to capital markets, are expected to affect the value of NWC.

Consequently, this research analyzes the impact of the institutional environment of the country where a firm is established on the firm's NWC valuation. We analyze a sample of 30 countries during the period 1995 to 2013. We contribute to the litera-



ture in several ways. First, we study the relation between NWC and value in a large sample of countries, providing comparable evidence outside the United States and United Kingdom. Second, we analyze whether the value of NWC depends on laws, the quality of their enforcement, or a country's level of financial and economic development. Thus, this study complements previous research on the valuation of NWC and on the legal environment. Finally, we also contribute evidence to the debate over the role of the institutional setting in shaping firms' financial policies.

We find evidence for the following conclusions. First, the value of NWC varies across countries. Second, the net investment in operating working capital is worth more in countries with weaker creditor rights. Third, shareholders value NWC more highly in countries with more effective law enforcement. Fourth, the development of financial markets positively affects the value of NWC. Finally, we find a negative influence of economic growth on the valuation of this investment. In sum, our evidence shows that the valuation of NWC across the world is related to investor protection, the development of financial markets and a country's level of economic development.

This paper is organized as follows. Section 2 presents a literature review that explains the relation between the value of NWC and investor protection and a country's financial and economic development in more detail. In section 3, we describe our model and methodology. We present our sample and data in section 4. In Section 5, we report the univariate and multivariate results of our tests. Finally, Section 6 concludes with a summary of our findings.

2. THE VALUE OF NET OPERATING WORKING CAPITAL ACROSS THE WORLD

As noted in the Introduction, investment in NWC depends on the management of a firm's accounts receivable, inventories, and accounts payable. Following Hill et al., (2010) and Kieschnick, et al. (2013), we use the variable NWC as a measure of working capital management. This variable is defined as the sum of accounts receivable and inventories net of accounts payable. As Deloof (2003) suggests, a greater net investment in operating working capital allows firms to increase their sales and profitability. While granting trade credit affects sales positively, larger inventories can reduce supply costs and price fluctuations as well as protect against the loss of business due to product scarcity. Moreover, firms may obtain an important discount for early payments by reducing supplier financing. Alternatively, greater NWC



involves more financing and opportunity costs. More NWC requires financing and, consequently, firms face additional financing expenses, which increases their credit risk (Kieschnick, et al. 2013) and increases the probability of bankruptcy. Consistent with these ideas, previous research has shown that the way in which a firm manages its NWC has a significant effect on both its value and risk level.

Although the effect of NWC on a firm's value and risk is entirely accepted in the literature, there is no research that analyzes whether the value of NWC varies across countries. Given the importance of the legal environment, investor rights and the enforcement of laws in mitigating agency conflicts between insiders and outsiders and in obtaining external financing, this could affect the value of NWC. Likewise, this valuation could also depend on the development of capital markets and the economic growth of a country.

2.1. Investor protection

An investor is protected by both laws and the system that enforces them. La Porta et al. (2000) show how laws and the effectiveness of their enforcement vary across countries. While in many countries, the expropriation of minority shareholders and creditors (outsiders) by managers and controlling shareholders (insiders) is extensive, in other countries outside investors are better protected by laws. When outside investors finance firms, they face a risk because the returns on their investments might never materialize if the controlling shareholders or managers expropriate them (La Porta et al. 2000). As these authors indicate, expropriation can take a variety of forms, but in all cases insiders use the profits of the firm to benefit themselves rather than returning the money to outside investors. The extent to which controlling shareholders can extract private benefits from their position depends largely on how well the interests of outside investors are protected (Pinkowitz et al., 2007).

Controlling shareholders can convert current assets into private benefits at a lower cost than that of converting fixed assets (Myers and Rajan, 1998), so investors are expected to value NWC less if they believe this net investment is partly consumed as private benefits. Indeed, Pinkowitz et al. (2006) demonstrate that outside investors discount the value of cash holdings in countries with poor investor protection to reflect their expectation that they will not receive the full benefit of these assets. Thus, controlling shareholders can easily convert part of NWC into private benefits when outsiders are less protected by law.



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In addition, La Porta et al. (2000) state that in countries where investor rights – such as the voting rights of the shareholders and the reorganization and liquidation rights of the creditors – are extensive and well enforced by regulators or courts, investors (shareholders and creditors) are willing to offer financing at more favorable terms. Djankov et al. (2007) and Benmelech and Bergman (2011), for example, show that creditor protection increases the willingness of creditors to extend credit and take risks. Because, as previously stated, NWC is a net investment that firms have to finance, the value of NWC could be higher in countries with strong investor protection.

However, as more NWC requires financing and implies additional financing expenses that increase a firm's credit risk, shareholders could value NWC less in countries with strong creditor protection, that is, in countries where it is more likely that managers and controlling shareholders may lose control in the event of financial distress. In these countries, creditors have a greater capacity to force repayment or take control of the firm in the event of default. This view is also consistent with Acharya et al. (2011) and Cho et al.'s (2014) idea that managers and shareholders try to avoid risking the loss of control in the event of financial distress. These authors suggest that strong creditor protection induces managers and shareholders to make decisions that minimize risk, although these decisions reduce the value of a firm. Hence, the value of NWC could be lower in countries with strong creditor rights.

Although the legal rights of creditors during reorganization and liquidation procedures are important for firms' external financing, authors such as Boubakri and Ghouma (2010) and Bae and Goyal (2009) show that the enforcement of debt contracts is more important. The legal structures that specify the resolution of default also differ widely across countries (Claessens et al., 2001). Some countries, for example the US, have an explicit bankruptcy code that specifies and limits the creditor's rights and facilitates the reorganization of the firm. In contrast, other countries have weakly enforced codes and creditors have more difficulties in accessing collateral or seizing a distressed firm's assets. Indeed, La Porta et al. (1998) indicate that a strong system of legal enforcement could substitute for weak rules because active and well-functioning courts can step in and rescue investors abused by the management. Therefore, the existence of defined bankruptcy procedures for corporate reorganization and the deferral of debt payments could also affect the value of NWC. Moreover, the values of the use and offer of trade credit are also expected to depend on the legal enforceability of the contract. For example, when a firm offers trade credit, it delivers goods to its customer, who does not pay immediately but promises to pay at a later date. This implies an implicit financing contract in which the supplier assumes the risk that the customer will



not pay in the future. In the absence of the capacity to repossess goods, suppliers in countries with inefficient legal systems may not be willing to supply goods on trade credit and may instead require cash payments (Demirguc-Kunt and Maksimovic, 2001). Consequently, we would expect a higher value of NWC for firms in countries with strong enforcement of investor rights.

Because investor protection depends on both legal rights and the extent to which the rights are respected and enforced, we empirically examine how laws protecting investors (creditors and shareholders) and their enforcement affect the value of NWC separately.

2.2. Financial and economic development

We also analyze whether a country's financial and economic development can affect the valuation of NWC. Taking into account the above-mentioned points, we hypothesize that firms that obtain external financing more easily and under better terms value NWC more because the cost of funds used to finance this short-term investment is lower, and they have fewer difficulties in obtaining new financing. Thus, the net investment in operating working capital could be worth more in countries with broader equity and debt markets, that is, in countries with more developed capital markets.

With regard to economic development, previous research demonstrates that economic growth has an important effect on the net investment in operating working capital as well as on all its individual components. However, how shareholders value NWC in relation to economic development is unclear¹. We assess two conflicting views of whether greater economic growth increases or decreases the value of NWC. The first view hypothesizes that economic growth has a positive effect on the value of NWC. This is based on Johnson et al.'s (2000) idea that a deterioration in future prospects leads insiders to expropriate outsiders if the latter are unable to do anything about it, and this higher possibility of expropriation could result in a fall in asset prices and, as a consequence, in a lower valuation of NWC. In contrast, the second view hypothesizes that NWC is valued more in countries with lower economic growth. This view suggests that, under worse economic prospects, shareholders

¹ Kieschnick et al. (2013), for example, do not find macroeconomic variables to be significant influences on the valuation of NWC for a sample of US corporations.



value NWC more, as a greater net investment in operating working capital allows firms to increase their sales.

3. MODEL AND METHODOLOGY

To determine whether the value of NWC varies across countries, we use the valuation model proposed by Fama and French (1998), which employs cross-section regressions of firm value on earnings, investment and financing variables. Specifically, following the approach used by Pinkowtiz et al. (2006) to study the value of cash, we include the NWC as an independent variable in this model and adjust the measurement of net assets. Additionally, we use one-year differences instead of two-year differences to reduce the number of observations lost. Thus, our basic regression specification is

$$\begin{aligned} V_{i,t} = & \beta_0 + \beta_1 E_{i,t} + \beta_2 dE_{i,t} + \beta_3 dE_{i,t+1} + \beta_4 dNA_{i,t} + \beta_5 dNA_{i,t+1} + \beta_6 RD_{i,t} + \beta_7 dRD_{i,t} \\ & + \beta_8 dRD_{i,t+1} + \beta_9 I_{i,t} + \beta_{10} dI_{i,t} + \beta_{11} dI_{i,t+1} + \beta_{12} D_{i,t} + \beta_{13} dD_{i,t} + \beta_{14} dD_{i,t+1} \\ & + \beta_{15} dV_{i,t+1} + \beta_{16} dNWC_{i,t} + \beta_{17} dNWC_{i,t+1} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where X_t is the level of variable X in year t divided by the level of assets in year t ; dX_t is the change in the level of X from year $t - 1$ to year t ($X_t - X_{t-1}$) divided by assets in year t ; dX_{t+1} is the change in the level of X from year t to year $t+1$ ($X_{t+1} - X_t$) divided by assets in year t ; V is the market value of the firm calculated as the sum of the market value of equity, the book value of short-term debt, and the book value of long-term debt; E is earnings before interest and taxes; NA is total assets minus net operating working capital (NWC); RD is research and development expense; I is interest expense; D is total common dividends paid; and NWC is the net investment in operating working capital. When research and development expense is missing, we set it to zero.

The main coefficient to be analyzed is β_{16} because this reflects the increase in firm value as a consequence of a one-dollar increase in NWC. To investigate whether the value of NWC depends on investor protection, enforcement, and a country's financial and economic development, we allow all the coefficients of the model to vary depending on these characteristics. Because the value of variables that measure investor protection are not available for all analyzed periods, rather than using continuous variables we split the sample of countries into two groups according to the



differences between each of these variables. To confirm our hypotheses, the coefficient should be different for both subsamples of countries according to investor protection and a country's financial and economic development. This coefficient indicates the change in firm value associated with an additional dollar of NWC. We estimate the model using two alternative estimation methods: Fama-MacBeth (1973) and Ordinary Least Squares (OLS) with robust error.

4. DATA

Data for firm-specific variables are collected from the *COMPUSTAT* database. We use a sample of 30 countries for the period 1995-2013. We exclude financial firms and utilities and we eliminate firm-year observations with lost values and cases with errors in the accounting data. Next, to reduce the effect of outliers, we trim our sample at the 1% level by dropping 0.5% in each tail of each variable. These restrictions produced a final sample of 129,116 observations representing 18,753 firms across the world.

Table 1 reports descriptive statistics for dependent and independent variables of our model, and Table 2 displays correlations among all these variables. The correlation coefficient between value and the increase in NWC is positive and significant. This is consistent with previous literature indicating that investment in NWC positively affects market value. Moreover, correlations between independent variables are low, so multicollinearity problems are not expected in the sample.



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TABLE 1
DESCRIPTIVE STATISTICS

V is the market value of the firm calculated as the sum of the market value of equity, the book value of short-term debt, and the book value of long-term debt; E is earnings before interest and taxes; NA is total assets minus net operating working capital (NWC); RD is research and development expense; I is interest expense; D is total common dividends paid; and NWC is the net investment in operating working capital. X_t is the level of variable X in year t divided by the level of assets in year t; dX_t is the change in the level of X from year t - 1 to year t ($X_t - X_{t-1}$) divided by assets in year t; dX_{t+1} is the change in the level of X from year t to year t+1 ($X_{t+1} - X_t$) divided by assets in year t.

	Observations.	Mean	Std. Dev.	Median	Perc. 10	Perc. 90
$V_{i,t}$	129,116	1.3436	1.0742	1.0346	0.6518	2.2820
$E_{i,t}$	129,116	0.1167	0.2666	0.0647	-0.0254	0.2425
$dE_{i,t}$	129,116	0.0026	0.1034	0.0062	-0.0613	0.0714
$dE_{i,t+1}$	129,116	0.0248	0.0825	0.0084	-0.0385	0.0924
$dNA_{i,t}$	129,116	0.0492	0.1825	0.0448	-0.1323	0.2418
$dNA_{i,t+1}$	129,116	0.0781	0.2547	0.0413	-0.1198	0.2774
$RD_{i,t}$	129,116	0.0949	0.1513	0.0184	0.0000	0.3216
$dRD_{i,t}$	129,116	0.0107	0.0602	0.0000	-0.0112	0.0460
$dRD_{i,t+1}$	129,116	0.0168	0.0939	0.0000	-0.0129	0.0472
$I_{i,t}$	129,116	0.0115	0.0126	0.0076	0.0003	0.0273
$dI_{i,t}$	129,116	0.0002	0.0065	0.0000	-0.0046	0.0057
$dI_{i,t+1}$	129,116	0.0007	0.0070	0.0000	-0.0042	0.0063
$D_{i,t}$	129,116	0.0105	0.0182	0.0039	0.0000	0.0296
$dD_{i,t}$	129,116	0.0009	0.0099	0.0000	-0.0021	0.0058
$dD_{i,t+1}$	129,116	0.0013	0.0109	0.0000	-0.0021	0.0063
$dV_{i,t+1}$	129,116	0.1527	0.9623	0.0405	-0.3665	0.7147
$dNWC_{i,t}$	129,116	0.0106	0.0702	0.0076	-0.0553	0.0827
$dNWC_{i,t+1}$	129,116	0.0177	0.0818	0.0075	-0.0518	0.0951



TABLE 2
CORRELATIONS

V is the market value of the firm calculated as the sum of the market value of equity, the book value of short-term debt, and the book value of long-term debt; E is earnings before interest and taxes; NA is total assets minus net operating working capital (NWC); RD is research and development expense; I is interest expense; D is total common dividends paid; and NWC is the net investment in operating working capital. X_t is the level of variable X in year t divided by the level of assets in year t; dX_t is the change in the level of X from year t - 1 to year t ($X_t - X_{t-1}$) divided by assets in year t; dX_{t+1} is the change in the level of X from year t to year t+1 ($X_{t+1} - X_t$) divided by assets in year t.

	V_{it}	E_{it}	dE_{it}	$dE_{i,t+1}$	$dNA_{i,t+1}$	RD_{it}	dRD_{it}	$dRD_{i,t+1}$	I_{it}	dI_{it}	$dI_{i,t+1}$	D_{it}	dD_{it}	$dD_{i,t+1}$	$dV_{i,t+1}$	$dNWC_{it}$	$dNWC_{i,t+1}$	
E_{it}	0.0618***	1																
dE_{it}	0.1112***	0.2279***	1															
$dE_{i,t+1}$	0.1641***	0.2172***	0.035***	1														
dNA_{it}	0.2019***	0.0866***	0.1435***	0.0156***	1													
$dNA_{i,t+1}$	0.2295***	0.0586***	0.0629***	0.2188***	0.165***	1												
RD_{it}	0.0898***	0.0322***	0.0219***	0.0214***	0.0728***	0.0204***	1											
dRD_{it}	0.0989***	0.0393***	0.0602***	0.0249***	0.4293***	0.0732***	0.3223***	1										
$dRD_{i,t+1}$	0.1552***	0.0476***	0.0379***	0.1217***	0.1106***	0.506***	0.1296***	0.1296***	1									
I_{it}	-0.0707***	0.0662***	-0.0051***	0.0239***	-0.0854***	0.1707***	-0.0239***	-0.0032	0.1729***	1								
dI_{it}	0.0065***	-0.0102***	0.04***	0.0134***	0.2122***	0.0235	0.1496***	0.0119***	0.1729***	0.1253***	1							
$dI_{i,t+1}$	0.0622***	0.0129***	0.0013	0.0856***	0.2425***	0.0409***	0.1786***	0.2395***	-0.1163***	0.1253***	0.1253***	1						
D_{it}	0.1696***	0.1586***	0.0244***	-0.0193***	0.0333***	0.0347***	0.0233***	0.0432***	-0.0865***	0.0104***	0.025***	0.025***	1					
dD_{it}	0.0935***	0.0562***	0.0927***	0.0056***	0.0949***	0.0125***	0.042***	0.0318***	-0.0413***	-0.0017***	0.0221***	0.4055***	0.4055***	1				
$dD_{i,t+1}$	0.084***	0.0455***	0.0518***	0.1218***	0.0655***	0.0061***	0.0115***	0.051***	-0.0323***	-0.0198***	0.004	-0.0031	-0.0692***	0.004	1			
$dV_{i,t+1}$	0.0425***	0.0211***	0.0461***	0.2254***	0.0374***	0.4467***	0.0057***	0.1866***	-0.015***	-0.0089***	0.0747***	0.0195***	0.0243***	0.0899***	0.0899***	1		
$dNWC_{it}$	0.1208***	0.0931***	0.1978***	0.0237***	0.1566***	0.1052***	0.0269***	0.1814***	-0.0661***	0.133***	0.1469***	0.0433***	0.0855***	0.0352***	0.0238***	0.0238***	1	
$dNWC_{i,t+1}$	0.1377***	0.0837***	0.0621***	0.2264***	0.1371***	0.2033***	0.0025	0.0531***	-0.0347***	0.002	0.1709***	0.034***	0.0346***	0.0824***	0.2072***	0.0582***	0.0582***	1



TABLE 3
MEAN VALUE OF $V_{i,t}$ AND $NWC_{i,t}$ BY COUNTRY

V is the market value of the firm calculated as the sum of the market value of equity, the book value of short-term debt, and the book value of long-term debt. $dNWC_{i,t}$ is calculated as NWC in year t minus NWC in year $t-1$ divided by asset in year t .

	Obs.	Mean $V_{i,t}$	Mean $NWC_{i,t}$
Argentina	377	1.2426	0.1848
Australia	5,537	1.6206	0.1183
Austria	684	1.0423	0.2432
Belgium	821	1.3089	0.2165
Brazil	977	1.1693	0.1905
Canada	3,148	1.5798	0.1039
Denmark	786	1.5524	0.2787
Finland	980	1.3584	0.2649
France	5,108	1.3810	0.2577
Germany	5,111	1.3138	0.2485
Greece	1,551	1.2157	0.2862
Hong Kong	1,446	1.1801	0.1587
Ireland	396	1.5496	0.1655
Italy	2,154	1.2290	0.2293
Japan	40,551	1.0394	0.1908
Malaysia	5,881	1.0069	0.2572
Mexico	521	1.0981	0.1618
Netherlands	1,065	1.5511	0.2968
New Zealand	493	1.4324	0.1778
Norway	953	1.5028	0.1914
Philippines	629	1.2566	0.1469
Portugal	469	1.1156	0.1879
Singapore	3,767	1.1404	0.2351
South Africa	1,432	1.3576	0.2077
Spain	1,261	1.3636	0.1923
Sweden	2,018	1.6216	0.2502
Switzerland	1,728	1.4957	0.2254
Thailand	3,549	1.1798	0.2418
UK	10,523	1.5739	0.2073
US	25,200	1.7718	0.2086

Table 3 presents descriptive statistics for each country of the dependent variable of our model, that is, the market value of the firm, as well as of our variable of interest, namely, the ratio of NWC to total assets. This table also provides information



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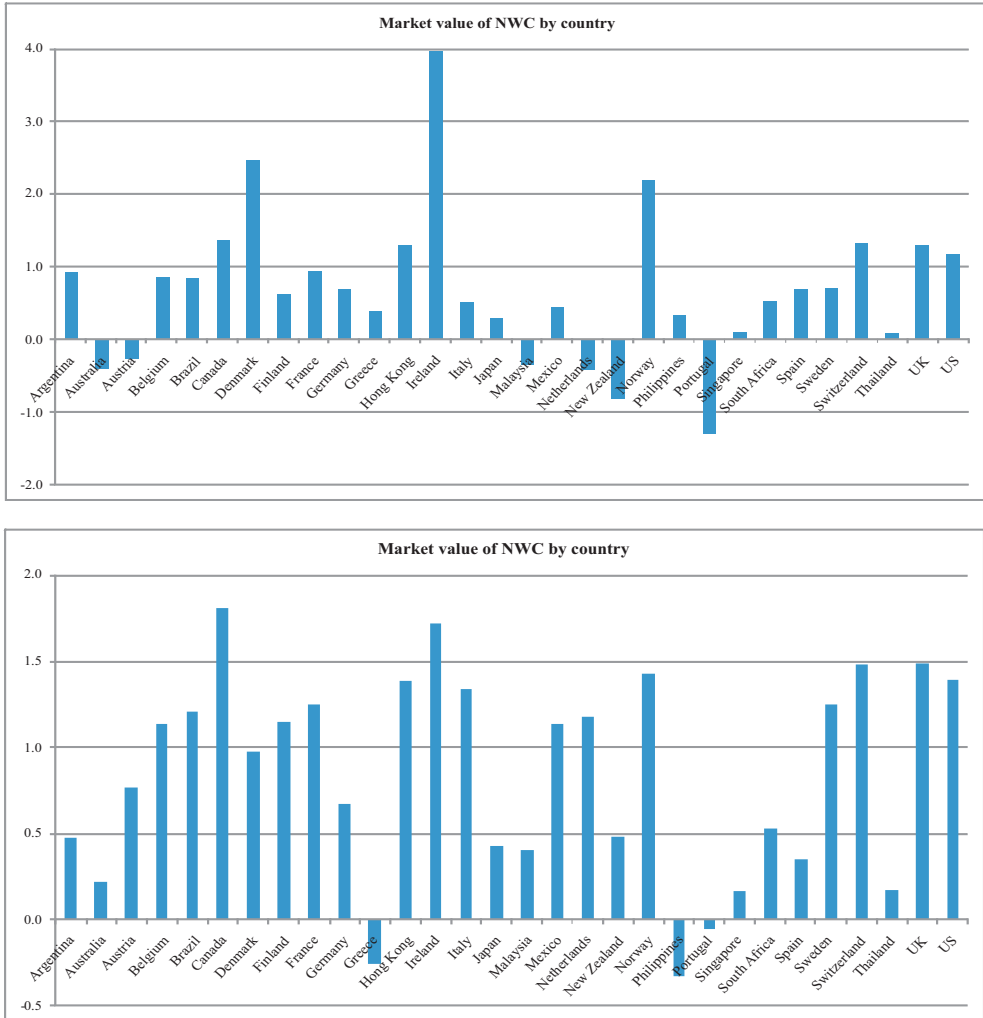
on the number of observations available for each country. As we would expect, there is a substantial variation in market value and the ratio of NWC to total assets across countries. Specifically, net investment in working capital over total assets ranges from 10.39% for Canada to 29.7% for the Netherlands.

TABLE 4
MARKET VALUE OF NWC BY COUNTRY
 Coefficients of the variable $dNWC_{it}$ for each country obtained by both estimation methods, Fama-MacBeth (1973) and OLS.

	Fama-MacBeth	OLS
Argentina	0.9378	0.4720
Australia	-0.3964	0.2180
Austria	-0.2581	0.7650
Belgium	0.8483	1.1344
Brazil	0.8308	1.2024
Canada	1.3691	1.8074
Denmark	2.4665	0.9749
Finland	0.6194	1.1489
France	0.9487	1.2491
Germany	0.6807	0.6686
Greece	0.3868	-0.2607
Hong Kong	1.2960	1.3815
Ireland	3.9627	1.7167
Italy	0.5268	1.3363
Japan	0.2860	0.4275
Malaysia	-0.3402	0.4046
Mexico	0.4361	1.1386
Netherlands	-0.4145	1.1777
New Zealand	-0.8235	0.4803
Norway	2.1912	1.4253
Philippines	0.3352	-0.3289
Portugal	-1.2961	-0.0520
Singapore	0.1068	0.1701
South Africa	0.5416	0.5300
Spain	0.6915	0.3524
Sweden	0.6942	1.2518
Switzerland	1.3217	1.4828
Thailand	0.0794	0.1737
UK	1.3015	1.4865
US	1.1763	1.3865



FIGURE 1
MARKET VALUE OF NWC BY COUNTRY
 Coefficients of the variable $dNWC_{i,t}$ across countries obtained by both estimation methods, Fama-MacBeth (1973) and OLS



Our first contribution comes from estimating model (1) separately for each of the 30 countries in our sample. Table 4 presents the coefficient of the variable for each country, obtained by both estimation methods, Fama-MacBeth (1973) and OLS. The estimated values of this coefficient vary reliably across countries. Conditional on our model, these



results are consistent with the view that the value of NWC varies across countries. Figure 1 illustrates these differences in the valuation of NWC across countries.

Data on country-specific variables are obtained from different sources. Like Cho et al. (2014), we use Djankov et al.'s (2007) creditor rights index (*Creditor Rights*) as a proxy for creditor protection. Following these authors, we use the 2002 values of this index in our analyses². This index has four components, each of which captures a different aspect of the strength of legal protection granted to creditors: No Automatic Stay, Secured Creditor Paid First, Restrictions on Reorganization, and No Management Stay. The value of this index is computed as the sum of these four variables, where each variable takes the value one if the bankruptcy code provides creditors with that specific type of protection, and zero otherwise. Thus, this index ranges from 0 (weak creditor rights) to 4 (strong creditor rights).

We measure the legal protection of minority shareholders against expropriation by insiders with the anti-self-dealing index (*Antiself*) proposed by Djankov et al. (2008). This index captures the regulation of firm self-dealing transactions along three dimensions: disclosure, approval procedures for transaction, and facilitation of private litigation when self-dealing is suspected. According to Djankov et al. (2008), this index is better than the index of anti-director rights in cross-country empirical work because the law's effectiveness in regulating the self-dealing problem is the basic element of shareholder protection. A higher score of the *Antiself* index implies that the minority shareholders are better protected from the potential self-dealing transactions of corporate insiders.

We use two variables for measuring enforcement. First, we use the International Country Risk Guide's (ICRG) assessment of the tradition of law and order in the country (*Rule of law*) as a measure of the integrity of the legal system. This variable is elaborated by the PRS Group and ranges from 0 to 6. Higher scores indicate a higher *Rule of law* in the country and, hence, greater efficiency of the legal system. Second, we measure the protection of property rights (*Property rights*) with the index of private property rights published by the Heritage Foundation. This is an annual index that measures the degree to which private property rights are protected by a country's laws and the degree to which its government enforces those laws. Moreover, it takes into account the likelihood that private property will be

² Although values of this index are not available for the last years of our sample, Djankov et al. (2007) indicate that this presents a high degree of persistence. Accordingly, Cho et al. (2014) show that the majority of countries did not experience any change in their creditor rights index for the period 1991-2004.



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expropriated and analyses the independence of the judiciary, the existence of corruption within the judiciary, and the capacity of individuals and businesses to enforce contracts. This index ranges between 0 and 100, with a higher score indicating greater legal protection of property rights.

We also collected data on a country's financial and economic development, mainly from *World Development Indicators* and the *Financial Development and Structure Database* of the World Bank.

We use three variables as proxies for the degree of financial development: financial system organization (*Financial system*), which classifies countries as market or bank-oriented; stock market capitalization to GDP (*Stock market cap*); and private bond market capitalization to GDP (*Bond market cap*). The stock market capitalization to GDP and private bond market capitalization to GDP variables come from the *Financial Development and Structure Database* of the World Bank. Countries with higher scores of both ratios are assumed to have more developed capital markets. Moreover, because La Porta et al. (1997, 1998) demonstrate that all the previous variables are highly correlated with indicators of the legal system (*Legal system*), we also use this classification to test for possible differences in the value of NWC. Qian and Strahan (2007) indicate that it is also interesting to use this classification to consider possible omitted variables such as culture and religion, which are not used in this study but can influence investors' protection.

Finally, we use GDP per capita growth (*GDP growth*) as a measure of economic development. This information is obtained from the *World Development Indicators* of The World Bank³.

Table 5 presents the values for our investor protection variables and the financial and economic development indices from all 30 countries. We can observe important differences among countries in the values of the measures under consideration. We use these values to create a dummy variable that allows us to separate sample countries into two groups based on the median value of each of these variables. The interaction of this dummy variable with all the independent variables and the constant allows us to determine whether the NWC valuation depends on investor protection and a country's financial and economic development.

³ The Appendix provides a summary of all country-specific variables and data sources.



TABLE 5
COUNTRY-LEVEL VARIABLES

Creditor right is a proxy for creditor protection, *Antitself* measures the legal protection of minority shareholders against expropriation by insiders, *Property rights* is an index of the protection of private property rights published, *Rule of law* assesses the law and order tradition in the country, *Legal system* classifies countries as common (1) or civil law system (0), *Financial system* classifies countries as market (1) or bank-oriented (0), *Stock market cap* is the stock market capitalization to GDP, *Bond market cap* is the private bond market capitalization, *GDP growth* is GDP per capita growth.

Countries	Creditor Rights	Antitself	Property rights	Rule of law	Legal system	Financial system	Stock market cap	Bond market cap	GDP growth
Argentina	1	0.34	39.28	3.71	0	0	28.49	5.22	0.0658
Australia	3	0.76	90	5.91	1	1	115.17	54.73	0.0779
Austria	3	0.21	90	6	0	0	24.27	41.19	0.0404
Belgium	2	0.54	85.5	5.07	0	0	64.39	40.74	0.0391
Brazil	1	0.27	50	2.17	0	0	57.75	18.32	0.0797
Canada	1	0.64	90	6	1	1	106.77	28.56	0.0547
Denmark	3	0.46	90.25	6	0	0	59.30	141.82	0.0405
Finland	1	0.46	90.24	6	0	0	106.59	23.64	0.0525
France	0	0.38	72.86	5.01	0	0	77.46	43.75	0.0351
Germany	3	0.28	90	5.39	0	0	46.06	41.55	0.0325
Greece	1	0.22	55.71	3.93	0	0	51.17	10.38	0.0424
Hong Kong	4	0.96	90	4.93	1	1	433.71	15.68	0.0291
Ireland	1	0.79	89.76	5.99	1	0	51.81	60.88	0.0672
Italy	2	0.42	60.95	4.91	0	0	38.06	31.60	0.0363
Japan	2	0.5	79.52	5.34	0	0	76.58	42.21	0.0038
Malaysia	3	0.95	56.67	3.83	1	1	131.38	51.97	0.0646
Mexico	0	0.17	50.95	2.53	0	0	28.50	12.80	0.0417
Netherlands	3	0.2	90	6	0	1	102.91	57.13	0.0434
New Zealand	4	0.95	91.75	5.87	1	0	38.91		0.0623
Norway	2	0.42	90	6	0	0	53.16	26.27	0.0724
Philippines	1	0.22	43.33	2.86	0	1	49.85	0.80	0.0624
Portugal	1	0.44	70	5.1	0	0	38.41	33.09	0.0454
Singapore	3	0.81	90	5.1	1	1	173.73	16.09	0.0549
South Africa	3	1	50	1.85	1	0	193.60	16.85	0.0441
Spain	2	0.37	70	4.65	0	0	75.91	31.81	0.0470
Sweden	1	0.33	84.52	5.04	0	1	105.03	47.39	0.0509
Switzerland	1	0.27	89	5.81	0	0	224.21	34.90	0.0415
Thailand	2	0.81	59.76	4.8	1	1	57.17	11.51	0.0532
UK	4	0.95	89.52	5.36	1	1	134.98	16.12	0.0440
US	1	0.65	88.1	5.73	1	1	127.24	100.49	0.0348



5. EMPIRICAL EVIDENCE

5.1. Univariate analysis

As a preliminary illustration of the possible importance of investor protection and the financial and economic development of a country in the value of NWC, Figures 2 and 3 rank countries according to each country-specific variable commented on in Section 4 and plot their market values of NWC, namely, the coefficients of the variable obtained from model (1) and that are reported in Table 4. Figure 2 plots estimates of the market values of NWC obtained from the Fama-MacBeth (1973) estimation method, and Figure 3 plots the estimated market values of NWC from the Ordinary Least Squares (OLS) method. Both figures offer a visual representation of the relation between each country-specific variable and the valuation of net investment in operating working capital. Graphs show that shareholders in countries with stronger enforcement of laws and greater stock market capitalization-to-GDP ratio value NWC more. In contrast, shareholders in countries with stronger creditor rights value net operating working capital less. With regard to the rest of the variables, the relation is unclear because the slope is not sufficiently pronounced, or it changes according to the estimation method used.



FIGURE 2

MARKET VALUE OF NWC BY INSTITUTIONAL CHARACTERISTICS

Coefficients of the variable $dNWC_{i,t}$ estimated by Fama-MacBeth (1973) and the country-level variables. *Creditor right* is a proxy for creditor protection, *Antiself* measures the legal protection of minority shareholders against expropriation by insiders, *Property rights index* is an index of the protection of private property rights published, *Rule of law* assesses the law and order tradition in the country, *Stock market capitalization* is the stock market capitalization to GDP, *Bond market capitalization* is the private bond market capitalization, *GDP growth* is GDP per capita growth.

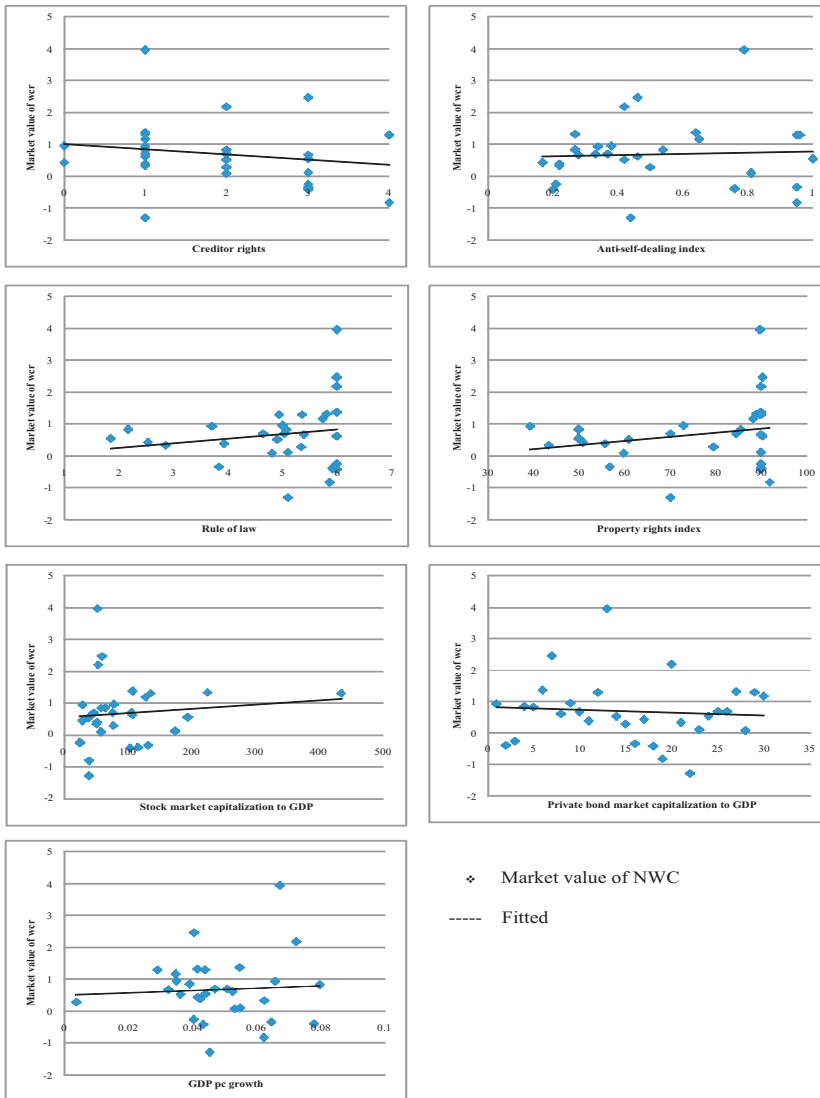




FIGURE 3

MARKET VALUE OF NWC BY INSTITUTIONAL CHARACTERISTICS

Coefficients of the variable $dNWC_{i,t}$ estimated by OLS and the country-level variables. *Creditor right* is a proxy for creditor protection, *Antiself* measures the legal protection of minority shareholders against expropriation by insiders, *Property rights index* is an index of the protection of private property rights published, *Rule of law* assesses the law and order tradition in the country, *Stock market capitalization* is the stock market capitalization to GDP, *Bond market capitalization* is the private bond market capitalization, *GDP growth* is GDP per capita growth.

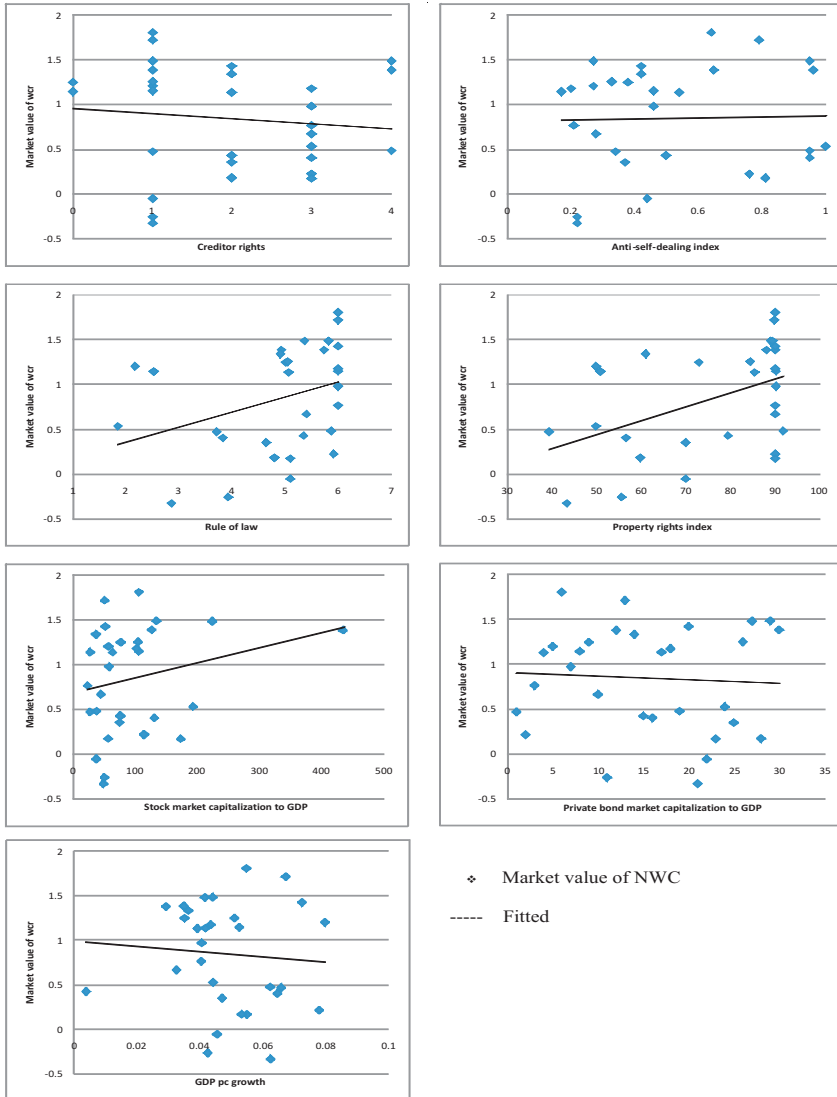




TABLE 6
COUNTRY GROUPS BY INSTITUTIONAL CHARACTERISTICS

Creditor right is a proxy for creditor protection, *Antiself* measures the legal protection of minority shareholders against expropriation by insiders, *Property rights* is an index of the protection of private property rights published, *Rule of law* assesses the law and order tradition in the country, *Legal system* classifies countries as common (1) or civil law system (0), *Financial system* classifies countries as market (1) or bank-oriented (0), *Stock market cap* is the stock market capitalization to GDP, *Bond market cap* is the private bond market capitalization, *GDP growth* is GDP per capita growth. Countries with higher investor protection variables (*Creditor right*, *Antiself*, *Property rights* and *Rule of law*) equal to 1, and 0 otherwise. Countries with greater financial and economic development (*Legal system*, *Financial system*, *Stock market cap*, *Bond market cap*, *GDP growth*) equal to 1, and 0 otherwise.

	<i>Creditor Rights</i>	<i>Antiself</i>	<i>Property rights</i>	<i>Rule of law</i>	<i>Legal system</i>	<i>Financial system</i>	<i>Stock market cap</i>	<i>Bond market cap</i>	<i>GDP growth</i>
Argentina	0	0	0	0	0	0	0	0	1
Australia	1	1	1	1	1	1	1	1	1
Austria	1	0	1	1	0	0	0	1	0
Belgium	0	1	0	0	0	0	0	1	0
Brazil	0	0	0	0	0	1	0	0	1
Canada	0	1	1	1	1	1	1	0	1
Denmark	1	1	1	1	0	0	0	1	0
Finland	0	1	1	1	0	0	1	0	1
France	0	0	0	0	0	0	1	1	0
Germany	1	0	1	1	0	0	0	1	0
Greece	0	0	0	0	0	0	0	0	0
Hong Kong	1	1	1	0	1	1	1	0	0
Ireland	0	1	1	1	1	0	0	1	1
Italy	0	0	0	0	0	0	0	0	0
Japan	0	1	0	1	0	0	1	1	0
Malaysia	1	1	0	0	1	1	1	1	1
Mexico	0	0	0	0	0	1	0	0	0
Netherlands	1	0	1	1	0	1	1	1	0
New Zealand	1	1	1	1	1	0	0	.	1
Norway	0	0	1	1	0	0	0	0	1
Philippines	0	0	0	0	0	1	0	0	1
Portugal	0	0	0	0	0	0	0	1	1
Singapore	1	1	1	0	1	1	1	0	1
South Africa	1	1	0	0	1	0	1	0	0
Spain	0	0	0	0	0	0	1	1	1
Sweden	0	0	0	0	0	1	1	1	1
Switzerland	0	0	1	1	0	0	1	1	0
Thailand	0	1	0	0	1	1	0	0	1
UK	1	1	1	1	1	1	1	0	0
US	0	1	1	1	1	1	1	1	0



5.2. Multivariate analysis

To test our hypotheses, we separate sample countries into two groups based on the median value of each one of the country-specific variables proposed. Table 6 specifies the group each country belongs to for each variable. When we use investor protection variables (*Creditor Rights*, *Antiself*, *Property Right* and *Rule of law*), countries with stronger rights and countries with better quality of law enforcement take a value of 1, and 0 otherwise. In regard to financial and economic development, countries with greater stock market capitalization to GDP and private bond market capitalization to GDP, and firms with higher economic growth, take a value of 1, and 0 otherwise.

We interact each dummy variable with all the independent variables and the constant. Tables 7 and 8 show estimates that allow us to examine whether the value of NWC depends on investor protection using Fama-MacBeth (1973) and OLS regressions, respectively. We find that NWC is valued more in countries with weaker creditor rights. Specifically, in countries with weak creditor rights, a one-dollar increase in NWC is valued by shareholders at roughly a dollar (\$1.09 using Fama-MacBeth (1973) and \$1.16 using OLS), while this is valued at about \$0.7 in countries with strong creditor rights (\$0.70 using Fama-MacBeth (1973) and \$0.72 using OLS). This result is consistent with the idea that, under strong creditor rights, shareholders value NWC less because it is more likely that creditors will take control of the firm in the event of default.

With regard to the legal protection of minority shareholders against expropriation, we do not find evidence that the anti-self-dealing index (*Antiself*) influences the value of net investment in operating working capital. Although we find that the coefficient of the change in NWC is greater in countries with stronger legal protection, the difference in coefficients is not significant for either of the two estimation methods.

The last rows in Tables 7 and 8 examine, more specifically, how the enforcement of laws affects NWC valuation. Previous research (La Porta et al. 1998; Boubakri and Ghouma, 2010; and Bae and Goyal, 2009) demonstrates that the enforcement of laws is more important than rights written into the laws for investor protection. When we use the *Rule of law* variable, we find that the value of NWC is greater in countries with more efficient legal systems. Specifically, we find that a one-dollar increase in NWC is associated with an increase in firm value of \$1.21 using Fama-



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MacBeth (\$1.26 using OLS) in countries with a higher rule of law and an increase of \$0.54 (using Fama-MacBeth) and \$0.66 (using OLS) in countries with a lower rule of law score. Similarly, we find that the coefficient of the change in NWC is slightly greater than one for countries with greater legal protection of property rights and lower than one for the other countries. This seems to indicate that shareholders think it is easier for insiders to convert part of NWC into private benefits when outsiders are less protected by law. This implies that outside investors discount NWC in countries with poor law enforcement. In addition, this result could also be because, in this case, firms have more difficulties in obtaining new external financing and they receive financing under less favorable terms.

Therefore, the above results show that laws protecting creditor rights and the enforcement of these laws affect the value of NWC in different ways.

Finally, Tables 9 and 10 report the relation between the value of NWC and measures of a country's financial and economic development. Previous literature suggests that both laws and the enforcement of investor rights are highly correlated with financial and economic development. We first examine whether the legal system (common-law versus civil-law countries) and the financial system organization (market- versus bank-oriented) influence NWC valuation. The results show that the value of NWC does not vary according to these two classifications. However, these variables are not specific measures of a country's financial development. Indeed, La Porta et al. (2000) indicate that bank-versus-market classification is not the best way to distinguish financial systems. We then analyze the influence of the development of stock and credit markets on the value of NWC. Specifically, we use the ratio of stock market capitalization to GDP and the ratio of private bond market capitalization to GDP as proxies for the degree of financial development. Again, results show that a dollar of NWC is valued by shareholders at roughly a dollar in countries that are more financially developed, while it is worth much less in countries with lower scores for both ratios. For example, using Fama-MacBeth (1973), in Table 9 we observe that an additional dollar of NWC is associated with a change in firm value of \$0.57 (\$0.76) in countries with low stock market development (private bond market development) and a change of about \$1.09 in countries with high development of both markets. Similar results can be seen in Table 10 for OLS estimations. In sum, the results show support for the hypothesis that broader equity and debt markets are associated with significantly higher values of NWC. This evidence is consistent with the idea that shareholders value net investment in operating working capital more when firms can obtain financing more easily and under better conditions.



TABLE 7

MARKET VALUE OF NWC BY INVESTOR PROTECTION VARIABLES

Estimations using Fama MacBeth (1973) regressions. V is the market value of the firm calculated as the sum of the market value of equity, the book value of short-term debt, and the book value of long-term debt; E is earnings before interest and taxes; NA is total assets minus net operating working capital (NWC); RD is research and development expense; I is interest expense; D is total common dividends paid; and NWC is the net investment in operating working capital. X_t is the level of variable X in year t divided by the level of assets in year t ; dX_t is the change in the level of X from year $t - 1$ to year t ($X_t - X_{t-1}$) divided by assets in year t ; $Creditor\ right$ is a proxy for creditor protection. *Antiself* measures the legal protection of minority shareholders against expropriation by insiders, *Rule of law* assesses the law and order tradition in the country, *Property rights* is an index of the protection of private property rights published. Time dummies are included in the estimations, but not reported. *t-statistic* in brackets. * indicates significance at 10% level, ** indicates significance at 5% level, and *** indicates significance at 1% level. *P-value of difference* indicates the p-value for the differences in coefficients for compared regressions.

Creditor Rights																			
	E_{it}	dE_{it}	dE_{it+1}	dNA_{it}	dNA_{it+1}	RD_{it}	dRD_{it}	dRD_{it+1}	I_{it}	dI_{it}	dI_{it+1}	D_{it}	dD_{it}	dD_{it+1}	dV_{it+1}	$dNWC_{it}$	$dNWC_{it+1}$	Intercept	Obs.
Low	0.3074 [*] (2.01)	1.0464 ^{***} (8.34)	2.1573 ^{***} (9.38)	0.9714 ^{***} (7.69)	0.9512 ^{***} (5.31)	0.8126 ^{***} (10.49)	-0.9435 ^{***} (4.1)	-0.0308 (0.24)	-4.7503 ^{***} (3.58)	-6.5290 ^{***} (4.89)	-12.0715 ^{***} (5.03)	9.3371 ^{***} (13.54)	0.1254 (0.22)	4.5040 ^{***} (5.32)	-0.1510 [*] (1.64)	1.0902 ^{***} (6.28)	0.8710 ^{***} (3.89)	1.0857 ^{***} (18.66)	92,391
High	-0.4207 ^{***} (-9.34)	0.4106 ^{***} (4.42)	1.4896 ^{***} (9.76)	0.8106 ^{***} (4.21)	0.6985 ^{***} (5.47)	0.5786 ^{***} (4.16)	-0.7555 ^{***} (3.11)	0.3125 [*] (2.37)	-7.0134 ^{***} (5.47)	-3.4234 [*] (2.5)	-9.7911 (4.21)	10.2497 ^{***} (12.71)	-0.8187 (-0.94)	4.0745 ^{***} (5.08)	-0.1616 (-1.87)	0.7001 ^{***} (4.78)	0.6096 ^{***} (4.41)	1.1706 ^{***} (21.51)	36,725
P-value of difference	0.001	0	0.001	0.43	0.096	0.087	0.362	0.132	0.162	0.032	0.346	0.396	0.411	0.505	0.882	0.021	0.219		
Anti-self dealing																			
	E_{it}	dE_{it}	dE_{it+1}	dNA_{it}	dNA_{it+1}	RD_{it}	dRD_{it}	dRD_{it+1}	I_{it}	dI_{it}	dI_{it+1}	D_{it}	dD_{it}	dD_{it+1}	dV_{it+1}	$dNWC_{it}$	$dNWC_{it+1}$	Intercept	Obs.
Low	0.0120 (0.19)	0.4707 ^{***} (6.44)	1.0677 ^{***} (8.84)	0.6572 ^{***} (3.17)	0.5396 ^{***} (5.03)	0.4041 ^{***} (4.93)	-0.5112 ^{***} (2.9)	0.3313 (1.33)	-6.7157 ^{***} (4.96)	-3.0459 (-1.47)	-7.6512 ^{***} (2.65)	9.1051 ^{***} (15.14)	-0.5537 (-0.77)	4.2341 ^{***} (4.4)	-0.1264 (-0.99)	0.8226 ^{***} (4.78)	0.8631 ^{***} (5.64)	1.1823 ^{***} (20.05)	24,606
High	-0.1594 ^{**} (-2.66)	1.0189 ^{***} (7.59)	2.3623 ^{***} (11.66)	1.0408 ^{***} (10.76)	0.9554 ^{***} (6.17)	0.8512 ^{***} (11.39)	-0.9214 ^{***} (4.32)	0.0495 (0.46)	-5.4479 ^{***} (4.52)	-6.8469 ^{***} (5.7)	-13.3342 ^{***} (6.05)	9.5857 ^{***} (15.92)	-0.8538 (-1.3)	3.3619 ^{***} (4.88)	-0.1549 [*] (2.05)	1.0247 ^{***} (6.56)	0.7293 ^{***} (4.09)	1.1085 ^{***} (21.34)	104,510
P-value of difference	0.019	0.001	0	0.042	0.005	0	0.06	0.321	0.318	0.121	0.053	0.592	0.769	0.422	0.731	0.253	0.481		
Rule of law																			
	E_{it}	dE_{it}	dE_{it+1}	dNA_{it}	dNA_{it+1}	RD_{it}	dRD_{it}	dRD_{it+1}	I_{it}	dI_{it}	dI_{it+1}	D_{it}	dD_{it}	dD_{it+1}	dV_{it+1}	$dNWC_{it}$	$dNWC_{it+1}$	Intercept	Obs.
Low	0.2720 ^{**} (3.59)	0.8098 ^{***} (5.69)	1.0776 ^{***} (5.67)	0.8211 ^{***} (3.51)	0.8384 ^{***} (3.67)	0.6923 ^{***} (7.5)	-0.3669 ^{***} (-2.04)	0.3694 ^{**} (2.78)	-1.7141 ^{**} (-2.78)	-2.9117 ^{***} (-3.15)	-4.4421 ^{***} (-3.15)	9.1200 ^{***} (17.52)	-0.3268 (-0.31)	4.9780 ^{***} (4.16)	-0.2224 [*] (-1.84)	0.5415 ^{***} (6.46)	0.6160 ^{***} (3)	0.9524 ^{***} (34.47)	31,961
High	-0.2330 ^{**} (-3.57)	0.8550 ^{**} (8.08)	2.1710 ^{**} (12.22)	1.1383 ^{***} (9.64)	1.0000 ^{***} (6.3)	0.7556 ^{***} (9.45)	-0.9684 ^{***} (-4.28)	0.0056 (0.05)	-5.7127 ^{***} (-4.56)	-7.8801 ^{***} (-6.25)	-16.4244 ^{***} (-6.07)	9.9562 ^{***} (15.27)	-0.6761 (-0.94)	3.7811 ^{***} (4.62)	-0.1483 [*] (-1.91)	1.2081 ^{***} (6.31)	0.9246 ^{***} (4.72)	1.1412 ^{**} (21.97)	97,155
P-value of difference	0	0.014	0	0	0.002	0.373	0.082	0.066	0.002	0	0	0.389	0.826	0.424	0.372	0.001	0.057		



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<i>Property rights</i>																			
	$E_{i,t}$	$dE_{i,t}$	$dE_{i,t-1}$	$dNA_{i,t}$	$dNA_{i,t-1}$	$RD_{i,t}$	$dRD_{i,t}$	$dRD_{i,t-1}$	$I_{i,t}$	$dI_{i,t}$	$dI_{i,t-1}$	$D_{i,t}$	$dD_{i,t}$	$dD_{i,t-1}$	$dV_{i,t-1}$	$dNWC_{i,t}$	$dNWC_{i,t-1}$	$Intercept$	$Obs.$
Low	0.4553*** (3.29)	0.6503*** (5.79)	1.5251*** (5.63)	0.5085*** (6.41)	0.6782*** (4.88)	0.8265*** (8.84)	-0.3726*** (-2.16)	0.4820*** (2.56)	0.4706 (0.57)	-4.5048*** (-3.74)	-5.9293*** (-3.2)	10.8631*** (14.93)	0.6874 (0.72)	7.0361*** (5.93)	-0.2838** (-2.42)	0.5907*** (8.7)	0.7374*** (3.91)	0.8632*** (26.2)	67,299
High	-0.3504*** (-7.83)	0.8422*** (8.84)	1.7191*** (9.99)	1.0347*** (7.95)	0.9367*** (5.84)	0.3454*** (4.51)	-0.8933*** (-4.11)	-0.0131 (-0.13)	-12.5367** (-11.02)	-5.0202** (-4.11)	-16.1016*** (-6.75)	7.3704*** (11.38)	-1.2453* (-1.56)	1.8956** (2.18)	-0.1239* (-1.67)	1.0379*** (6.17)	0.7693*** (4.69)	1.4757*** (29.01)	61,817
p-value of difference	0	0.185	0.491	0	0.065	0	0.108	0.031	0	0.651	0	0.009	0.21	0.004	0.08	0.011	0.779		



TABLE 8
MARKET VALUE OF NWC BY INVESTOR PROTECTION VARIABLES

Estimations using Ordinary Least Squares regressions. V is the market value of the firm calculated as the sum of the market value of equity, the book value of short-term debt, and the book value of long-term debt; E is earnings before interest and taxes; NA is total assets minus net operating working capital (NWC); RD is research and development expense; I is interest expense; D is total common dividends paid; and NWC is the net investment in operating working capital. X_t is the level of variable X in year t divided by the level of assets in year t ; dX_t is the change in the level of X from year $t - 1$ to year t ($X_t - X_{t-1}$) divided by assets in year t ; dX_{t+1} is the change in the level of X from year t to year $t+1$ ($X_{t+1} - X_t$) divided by assets in year t . *Creditor right* is a proxy for creditor protection, *Antiself* measures the legal protection of minority shareholders against expropriation by insiders, *Rule of law* assesses the law and order tradition in the country, *Property rights* is an index of the protection of private property rights published. Time dummies are included in the estimations, but not reported. *t-statistic* in brackets. *indicates significance at 10% level, **indicates significance at 5% level, and ***indicates significance at 1% level. *P-value of difference* indicates the p-value for the differences in coefficients for compared regressions.

Creditor Rights																		
	E_{it}	dE_{it}	dNA_{it}	dNA_{it+1}	RD_{it}	dRD_{it}	dRD_{it+1}	I_{it}	dI_{it}	dI_{it+1}	D_{it}	dD_{it}	dD_{it+1}	dV_{it}	$dNWC_{it}$	$dNWC_{it+1}$	Intercept	Obs
Low	-0.1788** (-8.66)	0.9914** (17.78)	2.0330*** (23.36)	1.0811*** (27.85)	1.0268** (18.95)	0.9423*** (42.08)	-0.9094*** (-10.96)	-5.0820*** (-18.08)	-7.0400*** (-16.07)	-13.5155*** (-33.22)	10.0160*** (33.22)	0.0668 (0.13)	4.6790*** (9.44)	-0.1124*** (-6.44)	1.1622*** (17.44)	0.9534*** (12.72)	1.3461*** (75.61)	92,391
High	-0.4263*** (-19.12)	0.4524*** (7.59)	1.6166*** (17.47)	0.8243*** (16.01)	0.3848*** (11.76)	-0.4061*** (-4.12)	0.3099*** (3.37)	-7.5328*** (-14.72)	-3.1156*** (-3.49)	-9.2740*** (-8.19)	9.1384*** (30.11)	-0.6133 (-1.28)	3.6578*** (7.66)	-0.1157*** (-4.41)	0.7209*** (9.81)	0.5425*** (7.22)	1.4904*** (32.13)	36,725
P-value of difference	0	0	0.001	0	0	0	0.02	0	0	0.003	0.045	0.343	0.138	0.915	0	0		
Anti-self-dealing																		
	E_{it}	dE_{it}	dNA_{it}	dNA_{it+1}	RD_{it}	dRD_{it}	dRD_{it+1}	I_{it}	dI_{it}	dI_{it+1}	D_{it}	dD_{it}	dD_{it+1}	dV_{it}	$dNWC_{it}$	$dNWC_{it+1}$	Intercept	Obs
Low	-0.2173*** (-9.66)	0.5432*** (9.55)	1.1239*** (11.7)	0.6524*** (9.93)	0.3188*** (8.52)	-0.4435*** (-3.0)	0.3430*** (3.55)	-8.2784*** (-14.53)	-1.6771*** (-1.69)	-9.0671*** (-8.06)	8.6970*** (19.13)	-0.1118 (-0.16)	4.5237*** (6.93)	-0.1132*** (-2.68)	1.0043*** (10.08)	0.8781*** (7.38)	1.2999*** (28.82)	24,606
High	-0.2683*** (-8.52)	1.0114*** (16.35)	2.4092*** (28.68)	1.0772*** (30.75)	0.8937*** (20.97)	-0.7405*** (-9.96)	0.1337*** (1.85)	-5.5145*** (-20.16)	-7.0299*** (-11.07)	-13.3250*** (-15.97)	9.4594*** (39.36)	-0.0974 (-2.42)	3.2596*** (8.11)	-0.1184*** (-7.67)	1.0255*** (18)	0.7487*** (12.4)	1.3925*** (70.4)	104,510
P-value of difference	0.187	0	0	0.004	0	0.039	0.17	0	0	0.002	0.138	0.278	0.099	0.909	0.853	0.332		
Rule of law																		
	E_{it}	dE_{it}	dNA_{it}	dNA_{it+1}	RD_{it}	dRD_{it}	dRD_{it+1}	I_{it}	dI_{it}	dI_{it+1}	D_{it}	dD_{it}	dD_{it+1}	dV_{it}	$dNWC_{it}$	$dNWC_{it+1}$	Intercept	Obs
Low	0.6427*** (2.15)	1.0344*** (7.50)	0.1998*** (12.15)	0.5366*** (9.15)	0.6068*** (17.14)	-0.2385*** (-2.74)	0.3977*** (3.5)	-2.4450*** (-7.22)	-1.7288*** (-2.19)	-4.3082*** (-5.94)	9.1715*** (29.91)	-0.6327 (-1.36)	4.2088*** (8.72)	-0.1315*** (-4.04)	0.6593*** (10.77)	0.5912*** (8.48)	1.1348*** (32.56)	31,961
High	-0.3547*** (-17.37)	2.2679*** (15.65)	1.1622*** (30.43)	0.9474*** (20.41)	0.7501*** (34.19)	-0.8238*** (-10.79)	0.0615 (0.81)	-5.7589*** (-18.28)	-8.1648*** (-11.55)	-14.6088*** (-15.66)	9.8857*** (36.8)	-0.5672 (-1.1)	3.8575*** (8.04)	-0.1162*** (-7.16)	1.2578*** (18.44)	0.9847*** (13.37)	1.3910*** (68.33)	97,155
P-value of difference	0	0	0	0	0.001	0	0.013	0	0	0	0.08	0.925	0.606	0.674	0	0		



Net Operating Working Capital and Firm Value: A Cross-Country Analysis

<i>Property rights</i>																			
	E_u	dE_u	$dE_{u,t}$	$dNA_{u,t}$	$dNA_{u,t}$	$dRD_{u,t}$	$dRD_{u,t}$	$dRD_{u,t}$	I_u	dI_u	$dI_{u,t}$	D_u	dD_u	$dD_{u,t}$	$dV_{u,t}$	$dNWC_{u,t}$	$dNWC_{u,t}$	<i>Intercept</i>	<i>Obs.</i>
Low	0.0945** (5.13)	0.5470** (10.8)	1.3219** (14.81)	0.6124** (15.78)	0.7306** (14.05)	0.8452** (23.73)	-0.2974** (-2.64)	0.3806** (3.23)	0.1576 (0.51)	-4.2450** (-5.84)	-5.8217** (-7.69)	11.8990** (35.75)	0.5906 (1.08)	7.1542** (12.58)	-0.1732** (-6.49)	0.7190** (13.1)	0.7433** (10.95)	0.9550** (62.52)	67,299
High	-0.4723** (-23.42)	0.8886** (15.71)	1.6788** (20.32)	1.0374** (24.21)	0.8439** (16.68)	0.2561** (10.71)	-0.7584** (-9.71)	0.0757 (0.99)	-13.8672** (-35.87)	-5.1596** (-7.09)	-16.3270** (-17.39)	6.9751** (2.6)	-1.2679* (-2.69)	1.9652** (4.65)	-0.0945** (-5.5)	1.1070** (14.31)	0.8494** (10.53)	1.6991** (67.5)	61,817
p-value of difference	0	0	0.003	0	0.118	0	0.001	0.03	0	0.374	0	0	0.01	0	0.012	0	0.314		



TABLE 9

MARKET VALUE OF NWC BY FINANCIAL AND ECONOMIC DEVELOPMENT

Estimations using Fama MacBeth (1973) regressions. V is the market value of the firm calculated as the sum of the market value of equity, the book value of short-term debt, and the book value of long-term debt; E is earnings before interest and taxes; NA is total assets minus net operating working capital (NWC); RD is research and development expense; I is interest expense; D is total common dividends paid; and NWC is the net investment in operating working capital. X_t is the level of variable X in year t divided by the level of assets in year t; dX_t is the change in the level of X from year t - 1 to year t ($X_t - X_{t-1}$) divided by assets in year t; dX_{t-1} is the change in the level of X from year t to year t+1 ($X_{t+1} - X_t$) divided by assets in year t. *Legal system countries* as common (1) or civil law system (0), *Financial system* classifies countries as market (1) or bank-oriented (0), *Stock market cap* is the stock market capitalization to GDP, *Bond market cap* is the private bond market capitalization, *GDP growth* is GDP per capita growth. Time dummies are included in the estimations, but not reported. *t-statistic* in brackets. *indicates significance at 10% level, **indicates significance at 5% level, and ***indicates significance at 1% level. *P-value of difference* indicates the p-value for the differences in coefficients for compared regressions.

	E_{jt}	dE_{jt}	$dE_{j,t-1}$	dNA_{jt}	$dNA_{j,t-1}$	RD_{jt}	dRD_{jt}	$dRD_{j,t-1}$	I_{jt}	dI_{jt}	$dI_{j,t-1}$	D_{jt}	dD_{jt}	$dD_{j,t-1}$	$dV_{j,t-1}$	$dNWC_{jt}$	$dNWC_{j,t-1}$	$Intercept$	<i>Obs.</i>
<i>Legal system</i>																			
Low	0.2798 [*] (2.41)	0.5510 ^{***} (7.6)	1.4814 ^{***} (5.7)	0.6965 ^{***} (4.62)	0.7143 ^{***} (4.33)	0.7570 ^{***} (7.91)	-0.4768 ^{***} (-3.5)	0.3544 (1.45)	0.1599 (0.19)	-6.3484 ^{***} (-3.21)	-6.9352 ^{***} (-2.86)	11.3572 ^{***} (15.66)	0.1380 (0.23)	6.4086 ^{***} (7.07)	-0.2293 [*] (-2.03)	0.7977 ^{***} (5.53)	0.9407 ^{***} (4.03)	0.8944 ^{***} (24.6)	67,744
High	-0.3074 ^{**} (-4.73)	1.1240 ^{***} (7.32)	2.1201 ^{***} (9.85)	1.0099 ^{***} (9.19)	0.9130 ^{***} (5.92)	0.5261 ^{***} (8.38)	-0.9097 ^{***} (-4.36)	0.0180 (0.16)	-11.4771 ^{***} (-11.08)	-4.2919 ^{***} (-3.68)	-15.2237 ^{***} (-7.15)	7.5158 ^{**} (12.59)	-0.9769 (-1.27)	1.9907 ^{**} (2.6)	-0.1298 [*] (-1.84)	0.9527 ^{***} (6.57)	0.6140 ^{***} (3.85)	1.3887 ^{***} (28.02)	61,372
<i>p-value of difference</i>	0	0.004	0.072	0.031	0.124	0.005	0.065	0.237	0	0.327	0.005	0.001	0.282	0.001	0.174	0.285	0.052		
<i>Financial system</i>																			
Low	0.3595 ^{**} (3.13)	0.5505 ^{***} (6.25)	1.5155 ^{***} (5.61)	0.6545 ^{***} (4.78)	0.7868 ^{***} (4.86)	0.7885 ^{***} (7.52)	-0.2047 (-1.53)	0.4178 [*] (1.66)	0.3942 (0.39)	-7.5741 ^{***} (-3.54)	-8.5788 ^{***} (-2.66)	11.6866 ^{***} (15.57)	-0.2345 (-0.3)	6.9287 ^{***} (7.4)	-0.2709 [*] (-2.44)	0.7157 ^{***} (4.94)	0.9271 ^{***} (3.95)	0.8732 ^{***} (25.75)	64,855
High	-0.3214 ^{**} (-5.73)	1.0945 ^{***} (8.12)	2.0704 ^{***} (9.93)	1.0112 ^{***} (9.22)	0.8945 ^{***} (5.57)	0.5084 ^{***} (8.38)	-0.9583 ^{***} (-4.7)	0.0227 (0.22)	-10.9392 ^{***} (-11.07)	-4.2541 ^{***} (-3.61)	-14.2168 ^{***} (-7)	7.6150 ^{***} (14.32)	-0.9220 (-1.32)	2.4827 ^{***} (2.86)	-0.1243 [*] (-1.66)	0.6213 ^{***} (6.84)	0.6213 ^{***} (4.14)	1.3791 ^{***} (28.71)	64,261
<i>p-value of difference</i>	0	0.002	0.118	0.005	0.472	0.001	0.006	0.171	0	0.147	0.045	0	0.553	0.001	0.082	0.081	0.07		
<i>Stock market capitalization</i>																			
Low	0.2413 [*] (1.87)	0.4017 ^{***} (3.16)	0.9374 ^{***} (4.21)	0.5202 [*] (2.42)	0.7409 ^{***} (5.6)	0.5041 ^{***} (3.47)	-0.3384 [*] (-1.69)	0.2456 (1.05)	-3.6465 ^{***} (-4.12)	-0.5549 (-0.45)	-5.9645 ^{***} (-2.29)	7.2595 ^{***} (14.32)	0.2313 (0.28)	3.5968 ^{***} (4.69)	-0.2298 [*] (-1.82)	0.5745 ^{***} (2.91)	0.7840 ^{***} (3.85)	1.1016 ^{***} (22.09)	19,471
High	-0.1892 [*] (-3.07)	0.8897 ^{***} (8.79)	2.0361 ^{***} (11.56)	1.0497 ^{***} (10.27)	0.9344 ^{***} (5.9)	0.8124 ^{***} (11.87)	-0.9597 ^{***} (-4.59)	0.0459 (0.44)	-5.9373 ^{***} (-4.46)	-7.8254 ^{***} (-6.67)	-13.8764 ^{***} (-6.25)	9.9911 ^{***} (16.85)	-0.8876 (-1.49)	4.3645 ^{***} (48.9)	-0.1486 [*] (-1.89)	1.0876 ^{***} (6.35)	0.7964 ^{***} (4.23)	1.1197 ^{***} (20.91)	109,645
<i>p-value of difference</i>	0.008	0.004	0.001	0.017	0.075	0.013	0.036	0.436	0.101	0	0.001	0.004	0.27	0.453	0.4	0.029	0.943		



Net Operating Working Capital and Firm Value: A Cross-Country Analysis

Private bond market capitalization																					
	$E_{i,t}$	$dE_{i,t}$	$dE_{i,t-1}$	$dNA_{i,t}$	$dNA_{i,t-1}$	$RD_{i,t}$	$dRD_{i,t}$	$dRD_{i,t-1}$	$I_{i,t}$	$dI_{i,t}$	$dI_{i,t-1}$	$D_{i,t}$	$dD_{i,t}$	$dD_{i,t-1}$	$dV_{i,t}$	$dNV_{i,t}$	$dNV_{i,t-1}$	$dNW_{i,t}$	$dNW_{i,t-1}$	Intercept	Obs.
Low	0.0097 (0.09)	0.5134** (5.46)	1.5736** (8.65)	0.7085** (6.03)	0.6695** (5.19)	0.7112** (3.96)	-0.7248** (-3.91)	0.2721* (1.74)	-5.4671** (-6.15)	-3.1833** (-2.24)	-9.0369** (-5.12)	8.7655** (11.74)	-0.2157* (-0.21)	3.5377** (3.94)	-0.1747* (-1.71)	0.7602** (5.68)	0.5217** (3.37)	1.1097** (29.24)	32,007		
High	-0.0102** (-2)	0.8280** (8.34)	1.9639** (10.47)	1.1261** (8.83)	0.9888** (5.89)	0.8030** (13.86)	-0.9848** (-4.13)	-0.0078 (-0.05)	-5.1531** (-4.34)	-7.8870** (-6.24)	-13.6875** (-5.64)	10.7397** (17.81)	-0.7627* (-1.64)	5.2424** (3.94)	-0.1429* (-1.84)	1.0920** (5.94)	0.8692** (4.26)	1.1096** (20.36)	96,616		
p-value of difference	0.254	0.023	0.035	0.001	0.008	0.555	0.251	0.333	0.712	0.002	0.025	0.01	0.65	0.032	0.391	0.026	0.003				
GDP growth																					
	$E_{i,t}$	$dE_{i,t}$	$dE_{i,t-1}$	$dNA_{i,t}$	$dNA_{i,t-1}$	$RD_{i,t}$	$dRD_{i,t}$	$dRD_{i,t-1}$	$I_{i,t}$	$dI_{i,t}$	$dI_{i,t-1}$	$D_{i,t}$	$dD_{i,t}$	$dD_{i,t-1}$	$dV_{i,t}$	$dNV_{i,t}$	$dNV_{i,t-1}$	$dNW_{i,t}$	$dNW_{i,t-1}$	Intercept	Obs.
Low	0.2134 (1.61)	0.9268** (9)	2.2028** (9.17)	1.0255** (6.93)	0.9502** (5.2)	0.7350** (10.01)	-0.8320** (-3.37)	0.0516 (0.4)	-4.3636** (-3.18)	-7.4389** (-6.23)	-12.7636** (-4.75)	10.6188** (17.34)	-0.0962 (-0.17)	5.2377** (8.17)	-0.1482 (-1.53)	1.0876** (5.97)	0.8360** (3.79)	1.0685** (18.64)	98,681		
High	-0.4140** (-3.51)	0.3896** (5.43)	1.0583** (8.05)	0.6467** (7.34)	0.7287** (5.38)	0.7378** (4.92)	-0.7125** (-3.87)	-0.0495 (-0.21)	-6.1512** (-7.82)	-4.5011 (-1.29)	-8.1731** (-6.13)	6.8445** (11.41)	-0.0908 (-0.17)	4.3424** (4.11)	-0.1493* (-1.99)	0.5938** (5.35)	0.5014** (5.46)	1.1601** (29.33)	30,435		
p-value of difference	0.012	0	0	0.033	0.148	0.98	0.661	0.74	0.124	0	0.056	0.003	0.996	0.424	0.988	0.004	0.123				



Net Operating Working Capital and Firm Value: A Cross-Country Analysis

TABLE 10

MARKET VALUE OF NWC BY FINANCIAL AND ECONOMIC DEVELOPMENT

Estimations using Ordinary Least Squares regressions. V is the market value of the firm calculated as the sum of the market value of equity, the book value of short-term debt, and the book value of long-term debt; E is earnings before interest and taxes; NA is total assets minus net operating working capital (NWC); RD is research and development expense; I is interest expense; D is total common dividends paid; and NWC is the net investment in operating working capital. X_t is the level of variable X in year t divided by the level of assets in year t ; dX_t is the change in the level of X from year $t - 1$ to year t ($X_t - X_{t-1}$) divided by assets in year t ; dX_{t-1} is the change in the level of X from year $t - 1$ to year $t - 1$ ($X_{t-1} - X_{t-2}$) divided by assets in year $t - 1$. *Legal system* classifies countries as common (1) or civil law system (0), *Financial system* classifies countries as market (1) or bank-oriented (0), *Stock market cap* is the stock market capitalization to GDP, *Bond market cap* is the private bond market capitalization, *GDP growth* is GDP per capita growth. Time dummies are included in the estimations, but not reported. *t-statistic* in brackets. * indicates significance at 10% level, ** indicates significance at 5% level, and *** indicates significance at 1% level. *P-value of difference* indicates the *p*-value for the differences in coefficients for compared regressions.

<i>Legal system</i>																				
	E_{it}	dE_{it}	$dE_{i,t-1}$	$dNA_{i,t}$	$dNA_{i,t-1}$	RD_{it}	dRD_{it}	$dRD_{i,t-1}$	I_{it}	dI_{it}	$dI_{i,t-1}$	D_{it}	dD_{it}	$dD_{i,t-1}$	$dV_{i,t}$	$dV_{i,t-1}$	$dNWC_{it}$	$dNWC_{i,t-1}$	Intercept	Obs.
Low	-0.0626*** (-4.18)	0.5523*** (11.87)	1.3055*** (15.71)	0.7254*** (16.07)	0.7770*** (13.72)	0.8055*** (26.5)	-0.4125*** (-3.83)	0.3522*** (3.06)	-0.0835 (-0.2)	-5.7719*** (-6.23)	-6.3941*** (-5.22)	12.2336*** (32.7)	0.5307 (0.84)	7.5507*** (12.52)	-0.1662*** (-5.84)	0.9311*** (13.85)	0.9362*** (11.33)	1.1286*** (56.02)	67,744	
High	-0.4118*** (-9.77)	1.1039*** (15.7)	2.0484*** (21.61)	1.0340*** (24.82)	0.8218*** (16.59)	0.4746*** (20.07)	-0.7616*** (-9.56)	0.1243* (1.62)	-12.7308*** (-35.96)	-4.2541*** (-6.46)	-15.5139*** (-19.02)	7.1310*** (26.8)	-1.2222* (2.8)	1.6878*** (4.08)	-0.0952*** (-5.65)	0.9671*** (13.81)	0.6597*** (9.12)	1.6329*** (57.33)	61,372	
<i>p</i> -value of difference	0	0	0	0	0.552	0	0.009	0.099	0	0.182	0	0	0.022	0	0.032	0.711	0.012			
<i>Financial system</i>																				
	E_{it}	dE_{it}	$dE_{i,t-1}$	$dNA_{i,t}$	$dNA_{i,t-1}$	RD_{it}	dRD_{it}	$dRD_{i,t-1}$	I_{it}	dI_{it}	$dI_{i,t-1}$	D_{it}	dD_{it}	$dD_{i,t-1}$	$dV_{i,t}$	$dV_{i,t-1}$	$dNWC_{it}$	$dNWC_{i,t-1}$	Intercept	Obs.
Low	-0.0470*** (-3.04)	0.5670*** (12.07)	1.2278*** (14.71)	0.7327*** (15.75)	0.8720*** (15.34)	0.8280*** (26.01)	-0.3138*** (-2.73)	0.3097*** (2.48)	0.7344* (1.73)	-7.0559*** (-7.5)	-7.8634*** (-5.65)	13.0203*** (33.42)	-0.0491 (-0.08)	8.1586*** (12.83)	-0.2023*** (-7.34)	0.8845*** (13.65)	0.9598*** (11.99)	1.0981*** (55.68)	64,855	
High	-0.4131*** (-12)	1.0811*** (15.97)	2.0438*** (22.1)	1.0226*** (25.22)	0.7849*** (15.98)	0.4524*** (19.58)	-0.7800*** (-10.07)	0.1387* (1.86)	-12.3216*** (-36.07)	-4.1275*** (-6.34)	-14.2507*** (-18.37)	7.1350*** (27.94)	-0.9459*** (-2.16)	1.7571*** (4.36)	-0.0836*** (-4.87)	0.9763*** (14.05)	0.6518*** (9)	1.7921*** (64.14)	64,261	
<i>p</i> -value of difference	0	0	0	0	0.246	0	0.001	0.239	0	0.011	0	0	0.245	0	0	0.334	0.004			
<i>Stock market capitalization</i>																				
	E_{it}	dE_{it}	$dE_{i,t-1}$	$dNA_{i,t}$	$dNA_{i,t-1}$	RD_{it}	dRD_{it}	$dRD_{i,t-1}$	I_{it}	dI_{it}	$dI_{i,t-1}$	D_{it}	dD_{it}	$dD_{i,t-1}$	$dV_{i,t}$	$dV_{i,t-1}$	$dNWC_{it}$	$dNWC_{i,t-1}$	Intercept	Obs.
Low	-0.1620*** (-6.27)	0.3958*** (5.59)	0.8854*** (7.63)	0.6463*** (8.86)	0.6972*** (8.12)	0.4015*** (9.51)	-0.3201*** (-2.16)	0.2367*** (1.62)	-5.1016*** (-9.47)	0.1742 (0.19)	-5.8900*** (-4.38)	8.0977*** (18.31)	-0.7177 (-1.15)	3.5085*** (6.05)	-0.1398*** (-3.16)	0.7909*** (8.52)	0.7812*** (7.08)	1.2588*** (21.42)	19,471	
High	-0.2709*** (-13.93)	0.8653*** (17.33)	2.1864*** (29.56)	1.0753*** (31.34)	0.8833*** (20.85)	0.8126*** (39.95)	-0.7852*** (-11.09)	0.1487* (2.11)	-5.9610*** (-20.98)	-7.9702*** (-12.16)	-13.9118*** (-17.7)	9.0735*** (41.76)	-0.6982* (-1.64)	3.7444*** (9.13)	-0.1125*** (-7.29)	1.0908*** (19.05)	0.8031*** (13.1)	1.3901*** (73.66)	109,645	
<i>p</i> -value of difference	0.001	0	0	0	0.052	0	0.005	0.59	0.138	0	0	0.002	0.979	0.807	0.561	0.006	0.862			



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<i>Private bond market capitalization</i>																			
	E_{it}	dE_{it}	dE_{it-1}	dNA_{it}	dNA_{it-1}	RD_{it}	dRD_{it}	dRD_{it-1}	I_{it}	dI_{it}	dI_{it-1}	D_{it}	dD_{it}	dD_{it-1}	dV_{it}	$dNWC_{it}$	$dNWC_{it-1}$	Intercept	Obs
Low	-0.1926** (-5.98)	0.5284** (7.15)	1.3727** (13.09)	0.7738** (14.82)	0.7146** (11.87)	0.4568** (12.96)	-0.4536** (-4.19)	0.3423** (3.17)	-6.6707** (-15.25)	-2.5113** (-3.17)	-8.9909** (-11.23)	8.3923** (27.8)	-0.5765 (-1.22)	3.2751** (7.37)	-0.1134** (-4.25)	0.8904** (11.4)	0.6307** (7.9)	1.3813** (38.66)	32,007
High	-0.3010** (-18.04)	0.8336** (16.94)	2.0693** (26.28)	1.1064** (28.87)	0.9392** (19.41)	0.8694** (39.74)	-0.8381** (-10.54)	0.0725 (0.92)	-5.2206** (-16.68)	-8.2861** (-11.37)	-13.9932** (-14)	10.2746** (35.19)	-0.4246 (-0.8)	4.6989** (9.35)	-0.1143** (-6.6)	1.0696** (16.76)	0.8813** (12.42)	1.3552** (66.2)	96,616
p-value of difference	0.003	0.001	0	0	0.004	0	0.004	0.044	0.007	0	0	0	0.831	0.034	0.975	0.076	0.019		
<i>GDP growth</i>																			
	E_{it}	dE_{it}	dE_{it-1}	dNA_{it}	dNA_{it-1}	RD_{it}	dRD_{it}	dRD_{it-1}	I_{it}	dI_{it}	dI_{it-1}	D_{it}	dD_{it}	dD_{it-1}	dV_{it}	$dNWC_{it}$	$dNWC_{it-1}$	Intercept	Obs
Low	-0.2627** (-15.52)	0.9652** (19.35)	2.1091** (26.46)	1.1265** (28.34)	1.0620** (19.74)	0.8067** (38.14)	-0.7623** (-9.75)	0.0315 (0.38)	-4.5802** (-15.06)	-8.1381** (-11.39)	-14.6339** (-15.12)	11.8056** (41.83)	0.2535 (0.46)	6.1665** (11.83)	-0.1183** (-6.72)	1.2048** (18.78)	0.9490** (13.62)	1.0797** (66.05)	98,681
High	-0.3175** (-10.03)	0.2662** (3.84)	1.3501** (12.82)	0.7252** (14.87)	0.6325** (11.81)	0.4374** (11.2)	-0.5804** (-5.29)	0.0936 (0.88)	-7.3414** (-16)	-1.7480** (-2.27)	-7.5489** (-9.85)	6.8552** (23.23)	-0.4287 (-0.99)	2.8085** (6.43)	-0.1004** (-3.98)	0.5239** (7.24)	0.4125** (5.17)	1.4073** (31.04)	30,435
p-value of difference	0.127	0	0	0	0	0	0.177	0.644	0	0	0	0	0.328	0	0.559	0	0		



Finally, we find that net operating working capital contributes significantly more to firm value in countries with lower economic growth. In particular, the results indicate that a one-dollar increase in NWC is associated with an increase in firm value of slightly more than one dollar in these countries but with an increase of about \$0.5 in countries with greater economic development. While previous research shows that cash is worth less in countries with a low level of economic development (e.g., Pinkowitz, et al. 2006), we find that NWC is valued more in these countries. This seems to support the idea that, given worse economic expectations, shareholders value NWC more because this is usually associated with an increase in their firm's sales. In contrast, in this situation cash is valued less, as it is more likely that insiders can expropriate outsiders.

In sum, the results from this study show that a dollar of NWC is worth roughly a dollar to shareholders in countries with weak creditor rights, strong enforcement of the law, greater financial development and in countries with less economic growth. In contrast, a dollar of NWC is worth much less in the other countries, in one case as little as \$0.52. We also find that laws protecting investors, and the enforcement of these laws, affect the value of NWC in different ways. While shareholders value NWC more in countries with weak creditor rights, this valuation is positively associated with the enforcement of laws. Although the legal system (common-law versus civil-law countries) and the financial system organization (market- versus bank-oriented) have usually been associated with financial development in previous research, our results indicate that the effects of these proxies on the value of NWC are different from the effects of other, more specific, measures of a country's financial development⁴.

6. CONCLUSIONS

This study complements previous research on the value of net investment in operating working capital (NWC). While previous studies are scarce and focus on a single country, we provide the first analysis of the valuation of NWC in an international setting. We use a sample of 30 countries for the period 1995 to 2013. We not

⁴ We obtain the same effect of investor protection and a country's financial and economic development on the value of NWC if we include the management of cash holdings in the NWC variable, that is, if we define NWC as the sum of cash holdings, accounts receivable and inventories net of accounts payable (results not presented but available from the authors upon request).



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only show that the value of NWC differs across countries but also how this valuation depends on the strength of investor protection, the level of enforcement, and a country's financial and economic development.

We find that shareholders assign a greater value to the NWC of companies in countries with weaker creditor rights, stronger enforcement of the law, greater financial development and in countries with less economic growth. According to the results, a dollar of NWC is worth roughly a dollar in these countries. In contrast, a one-dollar increase in NWC is valued with a discount in the other countries, being worth – in one case – as little as \$0.52.

In summary, our findings make valuable contributions to the current literature by showing the important role that investor protection and a country's financial and economic development play in the value of NWC. The results not only enrich our knowledge of the value of NWC but also extend the existing literature on the legal environment and a country's financial and economic development. While previous research has demonstrated that these factors affect a firm's capital structure and valuation, as well as the value of cash holdings, our results show that they also influence the value of NWC. This evidence supports the importance of the institutional setting where firms are established and its effects on financial decision-making and market valuation of a firm's financial policies.



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Appendix

Appendix A. Description of Country-specific variables and sources

Name	Description	Source
<i>Creditor Rights</i>	Creditor rights index equal to the sum of four binary indicator variables that each capture a different aspect of the strength of legal protection granted to creditors: No Automatic Stay, Secured Creditor Paid First, Restrictions on Reorganization, and No Management Stay. This index ranges from 0 (weak creditor rights) to 4 (strong creditor rights).	Djankov et al. (2007)
<i>Antiself</i>	The anti-self-dealing index measures the legal protection of minority shareholders against expropriation by insiders. This index captures the regulation of firm self-dealing transactions along three dimensions: disclosure, approval procedures for transaction, and facilitation of private litigation when self-dealing is suspected. A higher score implies that the minority shareholders are better protected.	Djankov, et al. (2008)
<i>Rule of law</i>	Integrity of the legal system. This variable comes from the PRS Group’s International Country Risk Guide (ICRG) and assesses the law and order tradition in the country. This ranges from 0 to 6, with higher scores indicating greater efficiency of the legal system.	International Country Risk Guide (ICRG)
<i>Property rights</i>	This index measures the protection of property rights and ranges between 0 and 100, with higher scores indicating greater legal protection of property rights.	Heritage Foundation
<i>Financial system</i>	This variable equals 1 for market-based financial systems and 0 for bank-based systems as defined in Demirguc-Kunt and Levine (1999).	Demirguc-Kunt and Levine (1999) and Demirguc-Kunt and Maksimovic (2002)
<i>Stock market cap</i>	The stock market capitalization to GDP ratio. This is a measure of stock market development.	Financial Development and Structure Database (World Bank)
<i>Bond market cap</i>	The private bond market capitalization to GDP ratio. This is a measure of bond market development.	Financial Development and Structure Database (World Bank)
<i>Legal system</i>	This variable takes the value one for common-law countries and the value zero for civil-law countries.	La Porta et al. (1998)
<i>GDP growth</i>	The nominal Gross Domestic Product (GDP) per	World Development



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BANCO SANTANDER, S.A.
TELEFONICA, S.A.
BBVA
CITI
BANCO SABADELL
BANKIA
CLIFFORD CHANCE
FIDELITY WORLDWIDE INVESTMENT
INDITEX
KPMG
LA CAIXA
BOLSAS Y MERCADOS ESPAÑOLES
URIA & MENENDEZ
ACS
BANCO POPULAR
CAJA RURAL CASTILLA LA MANCHA
DELOITTE
ENDESA, S.A.
EY
FUNDACIÓN MUTUA MADRILEÑA
MAPFRE
ZURICH ESPAÑA
MIRABAUD
BAKER & MCKENZIE
J&A GARRIGUES, S.L.
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