Asset redeployability, sustainability, and managerial prudence: Evidence from economic policy uncertainty

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Abstract

Capitalizing on a novel measure of asset redeployability, we explore the effect of economic policy uncertainty (EPU) on redeployable assets using a unique text-based measure of EPU. Asset redeployability is an important aspect of sustainability that has been largely overlooked. More redeployable assets can be re-purposed for a variety of uses, lessening the necessity for new products and thus conserving natural resources. Based on an immense sample of over 200,000 observations over three decades, our results reveal that greater uncertainty raises asset redeployability significantly. Our findings corroborate the managerial prudence hypothesis. The future deployment of assets is less predictable in times of increased uncertainty. Consequently, during uncertain times, it is more prudent to have assets that can be redeployed for multiple purposes. Further analysis confirms the results, including propensity score matching, entropy balancing, instrumental-variable analysis, GMM dynamic panel data analysis, and using Oster's (2019) approach for testing coefficient stability. Apparently, uncertain times foster sustainability by inducing firms to adopt more redeployable assets.

JEL Classification: G30, G31, G32

Keywords: asset redeployability, redeployable assets, economic policy uncertainty, EPU, asset specificity, investment irreversibility

I. Introduction

Asset redeployability is an important feature of sustainability that has received surprisingly little attention in the literature. Redeployable assets are those that can be used in several ways. Assets with high redeployability foster sustainability because they may be reassigned for various purposes as circumstances change, reducing the need to develop new assets and thereby conserving natural resources. This is akin to the concept of recycling. When products can be reused, recycled, or redeployed, fewer natural resources are consumed since fewer new products are required. Surprisingly, however, in spite of its significance, asset redeployability has received very little consideration in the literature. We fill this gap in the literature by studying the effect of uncertain times on asset redeployability using a distinctive measure of economic policy uncertainty (EPU) generated by cutting-edge machine learning algorithms (Baker, Bloom, and Davis, 2016).

The literature on economic policy uncertainty (EPU) has been rapidly expanding recently. Prior research shows that policy uncertainty has significant effects on crucial corporate policies and outcomes. For instance, when economic policy uncertainty rises, companies hold more cash (Julio and Yook, 2012; Jens, 2017), diminish capital investments (Gulen and Ion, 2016; Jens, 2017), and reduce M&A activities (Bonaime, Gulen, and Ion, 2018; Nguyen and Phan, 2017). Furthermore, economic policy uncertainty exacerbates firms' financial constraints and the cost of external financing (Pastor and Veronesi, 2013; Gilchrist, Sim, and Zakrajsek, 2014; Brogaard and Detzel, 2015), inhibit equity issuance (Colak, Durnev, and Qian, 2017), and raises equity volatility (Pastor and Veronesi, 2012). This is undeniably a crucial stream of contemporary research.

Based on an immense sample of over 200,000 observations over three decades, our results demonstrate that more uncertain times lead to a significant increase in redeployable assets. Our results are consistent with the managerial prudence hypothesis. It is less foreseeable how assets will be utilized in the future during periods of more uncertainty. As a result, it is more prudent to adopt assets that may be redeployed for diverse uses. When uncertainty is high, it is riskier to own assets with little redeployability. That is why uncertain times induce firms to employ more redeployable assets. We utilize the EPU index constructed by Baker, Bloom, and Davis (2016). This index is based on the frequency of news articles related to economic policy uncertainty. Because the index is constructed at the national level, it should be plausibly exogenous to firm-specific characteristics. Therefore, our results are more likely to reflect causality, rather than merely an association.

Further analysis strongly corroborates the results. In particular, we employ propensity score matching (PSM), where we match each observation in the treatment group with an observation outside the treatment group that is most similar. Further, we use entropy balancing where we adjust the weight of each observation in the control group such that the distributions of the variables in the treatment and the control groups are comparable (Hainmueller, 2012). Moreover, we execute an instrumental-variable analysis (IV), where we employ two alternate instrumental variables. Furthermore, we run a GMM dynamic panel data analysis as well as employ Oster's (2019) approach for testing coefficient stability. All the robustness checks strongly validate the results, suggesting that our findings are robust and are not likely driven by endogeneity.

Additionally, we find that the effect of EPU on asset redeployability is significantly more pronounced for firms with more fixed assets, but less pronounced for firms that pay higher dividends. Finally, we investigate the role of external governance using the takeover market, which is widely recognized as a crucial instrument of external governance. Using the takeover index developed by Cain, McKeon, and Solomon (2017) based on the staggered enactment of state laws, we document that more takeover exposure compels managers to be more prudent and utilize more redeployable assets during uncertain times.

Our study aptly makes several contributions to the literature. First, our results enrich a vital branch of the literature that examines the effects of economic policy uncertainty on corporate policies, outcomes, and strategies (Julio and Yook, 2012; Jens, 2017; Gulen and Ion, 2016; Bonaime, Gulen, and Ion, 2018; Nguyen and Phan, 2017; Pastor and Veronesi, 2013; Gilchrist, Sim, and Zakrajsek, 2014; Brogaard and Detzel, 2015; Chatjuthamard, Wongboonsin, Kongsompong, and Jiraporn, 2020; Ongsakul, Treepongkaruna, Jiraporn, and Uyar, 2020). This is an important area of the literature that has been swiftly expanding recently. Our study is the first to show that EPU has a palpable effect on redeployable assets.

Second, we enhance the literature on investment irreversibility as asset redeployability is a key concept in that branch of the literature (Bernanke, 1983; McDonald and Siegel, 1986; Abel and Eberly, 1996; Kim and Kung, 2016). Our study is the first to demonstrate that asset redeployability is significantly influenced by the degree of EPU. In addition, our findings extend the body of knowledge on sustainability. Asset redeployability is a crucial aspect of sustainability that has been largely disregarded in the literature. Our findings suggest that uncertain times promote sustainability by inducing firms to utilize more redeployable assets. More research on asset redeployability from a sustainability standpoint should be firmly encouraged in the future. Furthermore, we contribute to a fledging, albeit rapidly rising, area of the literature that exploits the asset redeployability score recently invented by Kim and Kung (2017) (Chen, Maslar, and Serfling, 2020; Padunsaksawasdi, Treepongkaruna, and Jiraporn, 2021).

Finally, we contribute to a growing body of research that employs the hostile takeover index as an exogenous indicator of takeover susceptibility (Cain, McKeown, and Solomon, 2017;

Ongsakul, Chatjuthamard, Jiraporn, and Jiraporn, 2020; Chatjuthamard, Jiraporn, Lee, Uyar, and Kilic, 2021; Ongsakul, Chatjuthamard, and Jiraporn 2022; Ongsakul, Chatjuthamard, Jiraporn, and Chaivisutangkun, 2021; Chatjuthamard, Ongsakul, and Jiraporn, 2021). While still in its infancy, this is an intriguing area that will probably generate a considerable quantity of research in the future because exogenous changes in takeover exposure are tough to come by.

II. Prior literature and hypothesis development

a. Asset redeployability

Asset redeployability is a central principle in the literature on investment irreversibility (Bernanke, 1983; McDonald and Siegel, 1986; Abel and Eberly, 1996). The costs of redeploying assets are a major source of investment irreversibility (i.e., the wedge between purchase and liquidation values of capital). Owing to the high cost of capital reversibility, firms are discouraged from making investments when there is uncertainty (Kim and Kung, 2016). Companies with less redeployable assets decrease their investments more than those with more redeployable assets in times of greater uncertainty, according to Kim and Kung (2017).

An important strand of the literature uses asset redeployability to quantify asset liquidation values when evaluating organizational strategies and practices, (Kim and Kung, 2016). The role of asset redeployability in capital structure outcomes such as debt maturity (Benmelech, 2008), cost of capital (Benmelech and Bergman, 2009; Ortiz-Molina and Phillips, 2014), and leverage, is the focus of a crucial branch of prior research (Benmelech and Bergman, 2009; Campello and Giambona, 2013). Almeida, Campello, and Hackbarth (2011) and Gavazza (2011) examine how asset redeployability affects asset reallocation through mergers and secondary market trading. Beutler and Grobety (2019) use asset redeployability as a proxy for liquidation.[1]

b. *Sustainability and asset redeployability*

The redeployability of assets is a crucial aspect of sustainability that has been largely ignored in the literature. Redeployable assets are those that can be utilized in a number of various ways. Assets with a high degree of redeployability promote sustainability because they may be repurposed as circumstances change, hence lowering the demand for new assets and saving natural resources. This concept is similar to that of recycling. When products are reused or recyclable, fewer new ones must be made, conserving natural resources. Yet, from a sustainability perspective, the redeployability of assets has received surprisingly little attention. We address this lacuna in the literature.

c. Economic policy uncertainty (EPU)

EPU has a variety of effects on capital investments and spending. Capital expenditures and corporate borrowing usually fall precipitously in times of policy uncertainty and financial crises, according to Kahle and Stulz (2013). Uncertainty can trigger a jolt in bank lending, resulting in a cut in capital expenditures. EPU, in general, has a negative impact on capital spending around the world. Foreign direct investments are generally hampered by high risk in terms of policy implications and volatile business dynamics in the financial sector.

The EPU index, invented by Baker et al. (2016), is used by Gulen and Ion (2015) to investigate the effect of uncertainty on corporate decisions. They discover that the EPU index and

[1] Additional studies related to asset redeployability are are Habib & Ranasinghe (2022), Rong et al. (2020), (Ortiz-Molina & Phillips (2014) and Sun (2022).

corporate capital investments have a negative relationship. According to the same study, between 2007 and 2009, there was a 32% decrease in capital spending in the United States due to the global financial crisis. Firms that rely on government contracts or have a high level of exposure to irreversible investments were hit harder (Al-Thaqeb and Algharabali, 2019).

Uncertainty can influence corporate decisions both internally and externally, according to the literature; internally, by reducing management's appetite for risk and promoting more cautious decisions (Bloom, 2009; Panousi & Papanikolaou, 2012); and externally, by raising financial market friction and less availability of capital in the economy. In other words, when EPU is high, management tends to be more conservative or is pressured to be more conservative by financial market conditions. As a result, uncertainty has a variety of effects on corporate and financial management decisions. For instance, several prior studies demonstrate that EPU has a negative effect on the cost of financing (Colak et al., 2017; Jens, 2017; Kelly et al., 2016; Pastor &Veronesi, 2012,2013; Al-Thaqeb and Algharabali, 2019).

Mergers and acquisitions (M&A) are adversely affected by uncertainty as well. The number of M&A transactions declines and the time taken to complete the process increases during periods of high uncertainty (Bonaime, Gulen, &Ion, 2018; Nguyen & Phan, 2017). The effects are more visible in strongly correlated companies and markets and are susceptible to potential economic policy changes (Bonaime, Gulen, &Ion, 2018). In times of high uncertainty, Nguyen and Phan (2017) show that uncertainty affects the type and size of payments, with more transactions using stock and paying smaller premiums. This practice, however, results in greater value creation for the acquirer's shareholders (Al-Thaqeb and Algharabali, 2019).[2]

[2] More research on economic policy uncertainty includes Shen et al. (2020), He et al. (2020) and Jiang et al. (2021) .

d. Hypothesis development

Based on the literature, two opposing hypotheses can be advanced regarding the effect of economic policy uncertainty on asset redeployability.

The managerial prudence hypothesis

This hypothesis posits that more uncertainty makes it difficult to anticipate how assets may be used in the future. The way assets are currently utilized may have to be modified or even completely discarded in the long run. During times of greater uncertainty, it is less predictable how assets may be deployed in the future. Therefore, it is more prudent to acquire assets that can be redeployed for different purposes. It is more risky to possess assets with lower redeployability when uncertainty is high. As a result, this view predicts that more uncertainty raises asset redeployability. Companies are likely to acquire more redeployable assets when experiencing more uncertainty.

The managerial myopia hypothesis

This hypothesis argues that uncertain times reduce managers' job security and therefore exacerbate managerial short-termism. Managers are less certain about their careers as uncertainty rises and are thus less likely to adopt a long-term perspective. Rather, they tend to concentrate on corporate policies and strategies that produce results in the short run, exacerbating managerial myopia.[3] During stressful times, managers are inclined to focus on the present, rather than the future, which is unpredictable. It is difficult enough to navigate an uncertain environment at present. It would be more challenging to make plans for the future, especially in times of high

[3] Managerial myopia has been discussed and documented in prior research, such as as Padungsaksawasdi et al. (2022), Brochet et al. (2015), Chatjuthamard et al., (2022), Chen et al. (2015), Dechow & Sloan (1991) and Li et al. (2021).

uncertainty. Consequently, they tend to adopt assets that are currently useful, regardless of how they might be deployed in the future. This view therefore predicts that uncertain times diminish asset redeployability.

III. Sample construction and data description

a. Sample construction

The data on asset redeployability are from Kim and Kung (2017). The data on economic policy uncertainty are from Baker, Bloom, and Davis (2016). Firm-specific characteristics are from COMPUSTAT. Outliers are removed at the 1% and 99% levels as needed. Our final sample consists of 200,933 firm-year observations from 1985 to 2015.[4] Our sample is one of the most comprehensive in the literature.

b. Economic policy uncertainty (EPU)

Following the literature in this area, we employ Baker et al.'s (2016) Economic Policy Uncertainty (EPU) Index (Bonaime et al., 2018, Chatjuthamard et. al. 2020; Gulen and Ion, 2016; Nguyen and Phan, 2017). In a nutshell, the EPU index is calculated using the monthly relative frequency of news articles in ten major U.S. newspapers. An article is considered relevant to EPU if it contains the terms "economic," "policy," and "uncertainty" (or other closely related terms). Baker et al. (2016) provide additional information on the construction of the EPU Index. This index has been used extensively in a large number of recent studies and is well-known in the literature (Gulen and Ion, 2016; Bonaime et al, 2018; Nguyen and Phan, 2017; Chatjuthamard,

[4] The asset redeployability score is available until 2015. That is why we end the sample period in 2015.

Wongboonsin, Kongsompong, and Jiraporn, 2020; Ongsakul, Treepongkaruna, Jiraporn, and Uyar, 2020).

c. Asset redeployability score

As we rely on Kim and Kung's (2017) measurement, we just offer a brief overview of their methodology for calculating the asset redeployability score. First, Kim and Kung (2017) calculate a redeployability score for every asset type in the 1997 BEA capital flow table. Kim and Kung (2017) create an industry-specific redeployability index by averaging the redeployability scores of 180 asset types. Kim and Kung (2017) compute firm-level asset redeployability as the value-weighted average of industry-level redeployability indices across a firm's business segments. In addition, the external validity of this asset redeployability metric is investigated. Corresponding to the notion that assets with greater redeployability have higher liquidation values, they demonstrate that this metric is highly linked to creditors' recovery rates following a company's default and with more active transactions in used asset marketplaces.

In conclusion, Kim and Kung's (2017) redeployability score is a novel, methodologically advanced, and empirically useful tool. A greater score indicates more redeployability. Kim and Kung (2017) provide further information about the redeployability score calculation. Several recent studies recognize Kim and Kung's (2017) redeployability score as a legitimate indicator of the redeployability of assets (Bonaime et al., 2018; Chen et al., 2020; Hasan et al., 2021). For example, utilizing Kim and Kung's (2017) redeployability score, Padungsaksawasdi, Treepongkaruna, and Jiraporn (2021) report that more board independence leads to less redeployable assets. Using an exogenous regulatory shock created by the Sarbanes-Oxley Act of 2002, they demonstrate that companies mandated to strengthen board independence face a greater decline in asset redeployability than firms not required to change board composition.

Chatjuthamard et al. (2022) find that more takeover threats diminish asset redeployability considerably. This is consistent with the argument that takeover threats reduce managers' job security, worsen managerial short-termism, and lead to less redeployable assets.

d. Other variables

It is imperative to control for factors that may affect asset redeployability (Padungsaksawasdi, Jiraporn and Treepongkaruna, 2021; Chatjuthamard et al., 2022). Several control variables are included. Specifically, we include firm size (Ln of total assets), profitability (EBIT/total assets), leverage (total debt/total assets), capital investments (capital expenditures/total assets), intangible assets (R&D/total assets and advertising expense/total assets), cash holdings (cash holdings/total assets), asset tangibility (fixed assets/total assets), dividend payouts (total dividends/total assets), and discretionary spending (SG&A expense/total assets).

In addition, we include firm fixed effects to control for any time-invariant firm characteristics that may be omitted from the model. It is not possible to include year fixed effects because EPU is constant across all firms in each year. To control for possible variation over time, we include a time trend variable instead. Table 1 shows the summary statistics for the redeployability score, the economic policy uncertainty (EPU) index, and for various firm characteristics.

IV. Empirical results

a. Baseline regression analysis

Table 2 shows the regression results where the dependent variable is the asset redeployability score. Standard errors are clustered by firm. Model 1 is a firm-fixed-effects regression. It is important to control for firm fixed effects because doing so mitigates the endogeneity bias that can be attributed to time-invariant unobserved characteristics. The coefficient of EPU in Model 1 is significantly positive, supporting the prediction of the managerial prudence hypothesis. During times of greater uncertainty, it is less predictable how assets may be deployed in the future. Therefore, it is more prudent to acquire assets that can be redeployed for different purposes, hence raising asset redeployability.

It is important to note that the R^2's in both Model 1 and Model 2 are very high, more than 90%, implying that our model specifications capture the vast majority of the variance in asset redeployability, leaving little room for unobserved heterogeneity. Also, to show that our results are not vulnerable to the estimation method, we run a random-effects regression in Model 2. The coefficient of EPU remains positive and significant.

b. Propensity score matching (PSM)

We use propensity score matching (PSM) to reduce endogeneity even further (Rosenbaum and Rubin, 1983; Lennox et al., 2011). We classify firms where the value of the EPU index is in the top quartile (highest uncertainty) as our treatment group. Based on ten firm characteristics (i.e., the ten control variables in the regression analysis), we identify a firm outside the treatment group that is most comparable to each firm in the treatment group. As a result, our treatment and control firms should have very similar characteristics in all observable dimensions.

We conduct diagnostic testing to ensure that our matching is successful. Table 3 Panel A shows the results. Model 1 is a logistic regression with a binary dependent variable equal to one if the firm is in the treatment group and zero if it is not. Model 1 encompasses the entire sample (pre-match). The result indicates that the treatment firms are significantly different in several ways from the rest of the sample. In particular, the treatment firms are smaller in size, are more leveraged, are more profitable, have less capital investments, spend less on R&D, spend more on advertising, hold less cash, have less discretionary spending, and have more fixed assets. These material differences may potentially complicate our analysis. Model 2 is a logistic regression for the propensity-score matched sample (post-match). In Model 2, none of the coefficients are significant. Therefore, our treatments and control firms are almost identical, statistically indistinguishable along all the observable dimensions. To the extent that EPU does not matter, the treatment and the control firms should exhibit a similar degree of asset redeployability.

In Panel B of Table 3, the regression result for the propensity-score matched sample is presented. The coefficient of the EPU index is positive and significant, further supporting the managerial prudence hypothesis. It is less foreseeable how assets will be utilized in the future during periods of more uncertainty. As a result, it is wiser to have assets that may be redeployed for diverse uses. Since our PSM results are consistent, endogeneity is unlikely.

c. Entropy balancing

Earlier research has relied on the rigid assumption of observable selection. To avoid this assumption, we use Hainmueller's (2012) entropy balancing technique, a generalization of conventional matching approaches. Entropy balancing corrects for self-selection caused by measurable characteristics by controlling for a large number of variables that may affect the treatment and control groups differently. Entropy balancing, in particular, enables a high degree of covariate balance by employing a reweighting scheme that incorporates covariate balance directly into a weight function applied to the sample units (Hainmueller, 2012). In practice, entropy balancing imposes a variety of equilibrium restrictions, implying that the matching covariate distributions of the treatment and control groups in the preprocessed data match precisely on all prespecified moments (Hainmueller, 2012; Balima, 2020). More comprehensive information about entropy balancing can be found in Hainmueller (2012).

The following is how we execute entropy balancing. We identify firms whose EPU index is in the top quartile as our treatment group. The remainder of the sample is regarded as the control group. Then, we conduct entropy balancing on all of the control variables to ensure that the mean, variance, and skewness of the observations in the two groups are similar. Table 4 displays the regression result for the entropy-balanced sample. The EPU index generates a positive and significant coefficient, again lending credence to the managerial prudence hypothesis. More uncertainty significantly increases asset redeployability.

d. Instrumental-variable analysis (IV)

We perform an instrumental-variable analysis as an additional robustness check. This technique is useful since it reduces the endogeneity biases caused by potential measurement errors, reverse causality, and unobserved heterogeneity. The level of EPU has been reported to peak around the time of the first Gulf War and the September 11 terrorist attack, which resulted in immense economic turmoil (Baker et al., 2016; Kim and Kung, 2016). Because the war and the attack ware inspired by external factors outside the United States, the shocks associated with the war and the attack were plausibly exogenous. Furthermore, the war and the attack were unexpected, making reverse causality extremely improbable. Several previous studies have utilized a similar approach in an instrumental-variable analysis (Kim and Kung, 2016; Chatjuthamard, Wongboonsin, Kongsompong, and Jiraporn, 2020; Ongsakul, Treepongkaruna, Jiraporn and Uyar, 2020). We create a binary variable equal to one for 1990 and 1991 for the first Gulf War and for 2001 and 2002 for the September 11 terrorist attack, and zero otherwise.

Table 5 displays the IV results. Model 1 is the first-stage regression with EPU as the dependent variable. The binary variable, External Shocks, has a positive and significant coefficient. The Gulf war and the terrorist attack, as expected, significantly increase the level of uncertainty. Model 2 is the second-stage regression with asset redeployability as the dependent variable. The coefficient of EPU instrumented from the first stage is significantly positive, again reinforcing the managerial prudence hypothesis. We apply propensity score matching (PSM) and entropy balancing on top of our IV analysis in Model 3 and Model 4. All the results are consistent and appear to be robust.

As far as economic significance is concerned, we estimate the magnitude of the effect of EPU on asset redeployability as follows. The coefficient of EPU in Model 2 Table 5 is 0.270. One standard deviation of EPU is 25.122. Therefore, when EPU rises by one standard deviation, the asset redeployability score increases by 0.270 multiplied by 25.122, which is 9.295. As one standard deviation of the asset redeployability score is 114.54, a rise by 9.295 represents an increase by 8.12%.[5]

As a robustness check, we use Baker et al.'s (2016) global economic policy uncertainty index (GEPU) as our alternative instrumental variable. The construction of GEPU is based on the same concept as the EPU from the United States. However, the scope is much wider, encompassing many countries worldwide. The assumption here is that any uncertainty at the global level is beyond the control of individual US companies and is therefore plausibly exogenous.

Table A1 in the Appendix displays the IV results. Model 1 represents the first stage of the IV analysis, with EPU as the dependent variable. The coefficient of global EPU is, as predicted, positive and significant. Not surprisingly, rising global uncertainty worsens the degree of uncertainty in the United States. Apparently, our instrumental variable satisfies the relevance requirement. Model 2 is the second-stage regression with asset redeployability as the dependent

[5] We rely on the estimates from the instrumental-variable analysis to estimate the economic significance because the IV results are less vulnerable to endogeneity.

variable. The coefficient of EPU instrumented from the first stage is significantly positive, again supporting the view that more uncertain times result in more redeployable assets. The GEPU is not available for the entire sample period. So, we use this variable simply as an alternate instrument.

e. GMM dynamic panel data analysis

This technique takes advantage of the dynamic relationships that exist between the explanatory variables. To eliminate any possible bias due to time-invariant unobserved heterogeneity, the variables are first differenced. after first-differencing, we estimate the model using GMM, using lagged values of the explanatory variables as instruments for the current explanatory variables. This method is significantly less susceptible to the omitted-variable bias. We assume that uncertainty about economic policy is endogenous. The result is summarized in Table 6. The coefficient of EPU is positive and significant, corroborating once again the notion that companies increase redeployable assets during periods of increased uncertainty. This technique relies on several strict assumptions, however. So, we utilize this technique simply as a robustness check.

f. Oster's (2019) method for testing coefficient stability

In addition, we apply Oster's (2019) insight to verify that our results are not impacted by the omitted-variable bias by calculating the size of the unobservables' influence required to exceed the effect of the observables, which would render our conclusions less reliable (Chintrakarn, Jiraporn, Tong, Jiraporn, and Proctor, 2020; Likitapiwat et al., 2022). Using Oster's (2019) approach on our regressions in Model 2 of Table 2, we determine that the influence of the unobservables must be greater than 4.01 times that of the observables for our results to be questionable. In general, in the literature, if the ratio is larger than one, the results are usually deemed trustworthy. Therefore, it would appear that the omitted-variable bias has little or no effect on our findings. Oster (2019) explains this approach for determining coefficient stability in further detail.

g. The moderating effects of asset tangibility and dividends

To gain further understanding, we explore possible cross-sectional variations in the effect of EPU on asset redeployability. In particular, we focus on two important firm characteristics, i.e., asset tangibility and dividends. First, asset tangibility can be an important factor. Fixed assets are less liquid and impose more risk on the firm during unpredictable times. On the one hand, firms with more fixed assets may be more cautious and adopt more redeployable assets during uncertain times. By contrast, it may be suggested that high fixed assets already force managers to be so prudent in various other ways that it is acceptable to take more risk by having lower asset redeployability during uncertain times. So, the effect of fixed assets is an empirical issue.

Dividends, according to agency theory, play a crucial governance function. Dividends reduce the free cash flow available to management, which may be employed for personal benefits rather than enhancing shareholder value (Grossman and Hart, 1980; DeAngelo, DeAngelo, and Stulz, 2006). Moreover, paying dividends increases the probability that new shares must be issued more regularly, so subjecting firms to more frequent assessment by the primary capital markets and reducing the likelihood of agency conflicts. When the corporation experiences uncertain times, the function of dividends as a governance instrument is especially critical. On the one hand, dividends, functioning as a governance mechanism, may force managers to be more prudent during uncertain times and increase asset redeployability further. On the contrary, dividends may substitute for managerial prudence as dividends reduce agency problems. So, firms that pay higher dividends do not need to be as careful and can afford to have lower asset redeployability.

We test the above hypotheses by creating interaction terms between EPU and asset tangibility and EPU and dividends. The coefficients of these two interaction variables should reveal the effect of EPU on asset redeployability for firms with high vs. low fixed assets and those with high vs. low dividends. The results are shown in Table 7. In Model 1, the coefficient of the interaction term is significantly positive, suggesting that the effect of EPU on asset redeployability is more pronounced for firms with more asset tangibility. This finding is consistent with the notion that firms with more fixed assets, which are less liquid, exercise more caution during uncertain times and raise asset redeployability to a greater extent. In Model 2, the coefficient of the interaction term is significantly negative, implying that the effect of EPU on asset redeployability is weaker for firms paying higher dividends. Apparently, dividends substitute for managerial prudence and make it less necessary to raise asset redeployability.

h. The moderating effect of external governance

To obtain further insights, we examine the role of external governance. The takeover market, often known as the market for corporate control, has long been viewed as one of the most important external governance mechanisms (Manne, 1965; Fama, 1980; Lel and Miller, 2015; Cain, McKeon, and Solomon, 2017). Unsurprisingly, a substantial amount of research has been conducted on the effects of the takeover market on various corporate policies, strategies, and outcomes (Bertrand and Mullainathan, 2003; Low, 2009; Garvey and Hanka, 1999; Cheng, Nagar, and Rajan, 2005; Ongsakul, Chatjuthamard, Jiraporn, Jiraporn, 2020; Chatjuthamard, Jiraporn, Lee, Uyar, and Kilic, 2021; Ongsakul, Chatjuthamard, Jiraporn, and Chaivisutangkun, 2021;

Chatjuthamard, Ongsakul, and Jiraporn, 2021). Clearly, this is a considerable and important stream of the literature.

Two arguments can be advanced about the effect of the takeover market. First, the takeover market, operating as a governance mechanism, may force managers to be more cautious and adopt more redeployable assets during uncertain times. On the contrary, it is conceivable that the disciplinary force of the takeover market already compels managers to be prudent and thus lessens the necessity for higher asset redeployability. We utilize the takeover index developed by Cain, McKeon, and Solomon, 2017) to capture firm-specific exposure to takeover threats. This index is principally based on the staggered adoption of state laws and is probably exogenous. More details about the construction of this index can be found in Cain, McKeon, and Solomon (2017).

We construct an interaction term between EPU and the takeover index. The regression result is shown in Table 8. The coefficient of the interaction variable is significantly positive, indicating that more takeover exposure results in a stronger effect of EPU on asset redeployability. Apparently, the disciplinary mechanism of the takeover market induces managers to be even more cautious during unpredictable times and use more redeployable assets.

V. Conclusions

Assets that have multiple possible applications are considered redeployable. Asset redeployability is a crucial concept in the literature on investment irreversibility (Bernanke, 1983; McDonald and Siegel, 1986; Abel and Eberly, 1996). In addition, it is a critically important aspect of sustainability that has been so far under-explored in the literature. Redeployable assets are conducive to sustainability because they may be used for different purposes as needed. This reduces the need for brand new assets, which in turn helps conserve energy and other scarce resources. Exploiting a novel proxy for asset redeployability recently constructed by Kim and Kung (2017), we explore the effect of uncertain times on redeployable assets. Previous research examines the effects of uncertainty on several corporate policies and outcomes (Julio and Yook, 2012; Jens, 2017; Gulen and Ion, 2016; Bonaime, Gulen, and Ion, 2018; Nguyen and Phan, 2017; Greenwald and Stiglitz, 1990; Pastor and Veronesi, 2013; Gilchrist, Sim, and Zakrajsek, 2014; Brogaard and Detzel, 2015). However, our study is the first to investigate the effect of uncertain times on asset redeployability.

Based on a massive sample of over 200,000 observations spanning over three decades, our results show that higher economic policy uncertainty raises asset redeployability significantly. Our findings corroborate the managerial prudence hypothesis, where greater uncertainty leads to more caution. It is prudent to use more redeployable assets during unpredictable periods since it is difficult to plan asset deployment ahead of time when faced with greater uncertainty. Redeployable assets are more flexible in their uses and are thus less risky. Additional analysis strongly corroborates the results including propensity score matching, entropy balancing, instrumental-variable analysis, GMM dynamic panel data analysis, and using Oster’s (2019) method for testing coefficient stability. Also, we find that the effect of EPU on asset redeployability is significantly more prominent for firms with more fixed assets but less pronounced for firms that pay higher dividends. Lastly, the takeover market, which is widely regarded as a crucial external governance mechanism, significantly strengthens the effect of EPU on asset redeployability.

Our results are noteworthy as they aptly contribute to several important areas of the literature including investment irreversibility, economic policy uncertainty, and sustainability. Furthermore, our findings offer several implications of practical value. First, shareholders and investors are informed by our research that managers exercise more prudence during uncertain times and formulate important corporate policies accordingly. Second, regulators benefit from our research as they learn that public economic policies and policy uncertainty have a palpable effect on corporate practices. Regulators should exercise caution when formulating public policies. Finally, our research has important implications for sustainability because we demonstrate that asset redeployability, which is a significant facet of sustainability that has been under-explored, is considerably influenced by uncertain times. We empirically demonstrate that companies promote more sustainability during uncertain times by adopting more redeployable assets.

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Table 1: Descriptive statistics

The asset redeployability score is constructed by Kim and Kung (2017). For ease of exposition and interpretation, we multiply the asset redeployability score by 1000. The economic policy uncertainty (EPU) index is constructed by Baker et al. (2016).

	Mean	SD	25th	Median	75th
Redeployability Score	404.901	114.540	355.667	415.756	467.274
Economic Policy Uncertainty (EPU)	102.917	25.122	80.150	101.195	116.009
Total Assets	2885.401	24148.070	18.159	105.547	683.510
Total Debt/Total Assets	0.315	0.463	0.035	0.218	0.407
EBIT/Total Assets	-0.143	0.752	-0.075	0.050	0.107
Capital Expenditures/Total Assets	0.065	0.082	0.016	0.039	0.080
R&D/Total Assets	0.064	0.166	0.000	0.000	0.046
Advertising Expense/Total Assets	0.012	0.035	0.000	0.000	0.004
Cash Holdings/Total Assets	0.184	0.232	0.020	0.082	0.256
Dividends/Total Assets	0.014	0.039	0.000	0.000	0.012
SG&A Expense/Total Assets	0.373	0.614	0.048	0.209	0.444
Fixed Assets/Total Assets	0.543	0.458	0.186	0.428	0.802

Table 2: The effect of economic policy uncertainty on asset redeployability

This table presents the baseline regression results. The asset redeployability score is constructed by Kim and Kung (2017). For ease of exposition and interpretation, we multiply the asset redeployability score by 1000. The economic policy uncertainty (EPU) index is constructed by Baker et al. (2016).

	(1)	(2)
	Fixed Effects	Random Effects
	Redeployability	Redeployability
Economic Policy Uncertainty (EPU)	**0.025*** **	**0.024*** **
	(7.835)	**(7.441)**
Ln (Total Assets)	0.958***	0.892***
	(5.169)	(5.019)
Total Debt/Total Assets	0.242	0.338
	(0.751)	(1.054)
EBIT/Total Assets	-0.358	-0.302
	(-1.256)	(-1.066)
Capital Expenditures/Total Assets	-8.404***	-11.685***
	(-6.770)	(-9.425)
R&D/Total Assets	-0.567	0.218
	(-0.525)	(0.204)
Advertising Expense/Total Assets	-1.859	2.324
	(-0.382)	(0.483)
Capital Expenditures/Total Assets	0.895	0.528
	(1.307)	(0.776)
Dividends/Total Assets	7.563***	8.031***
	(2.987)	(3.181)
SG&A Expense/Total Assets	0.702**	0.966***
	(2.251)	(3.114)
Fixed Assets/Total Assets	0.434	-1.479***
	(0.789)	(-2.727)
Time Trend	-1.132***	-1.129***
	(-31.688)	(-32.253)
Constant	414.929***	418.906***
	(426.034)	(336.810)
Firm Fixed Effects	Yes	No
Observations	199,661	200,933
Adjusted R-squared	0.970	0.026

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Propensity score matching (PSM)

This table displays the results of the diagnostic testing and the regression analysis with propensity score matching. The asset redeployability score is constructed by Kim and Kung (2017). For ease of exposition and interpretation, we multiply the asset redeployability score by 1000. The economic policy uncertainty (EPU) index is constructed by Baker et al. (2016).

Panel A: Diagnostic testing

	(1)	(2)
	Pre-Match	Post-Match
	Treatment (High EPU)	Treatment (High EPU)
Ln (Total Assets)	-0.055***	0.001
	(-20.350)	(0.150)
Total Debt/Total Assets	0.043***	0.007
	(2.610)	(0.314)
EBIT/Total Assets	0.088***	0.006
	(6.182)	(0.331)
Capital Expenditures/Total Assets	-0.301***	0.018
	(-3.440)	(0.164)
R&D/Total Assets	-0.279***	-0.029
	(-5.248)	(-0.454)
Advertising Expense/Total Assets	2.612***	0.069
	(13.903)	(0.282)
Capital Expenditures/Total Assets	-0.130***	0.036
	(-3.844)	(0.832)
Dividends/Total Assets	-0.056	-0.096
	(-0.369)	(-0.457)
SG&A Expense/Total Assets	-0.062***	-0.028
	(-3.772)	(-1.335)
Fixed Assets/Total Assets	0.071***	0.014
	(3.997)	(0.631)
Constant	-0.662***	0.011
	(-6.000)	(0.074)
Industry Fixed Effects	Yes	Yes
Pseudo R-squared	0.01	0.00
Observations	200,927	104,144

Robust z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Propensity score matching (Continued)

Panel B: Regression analysis

	(1) Redeployability
Economic Policy Uncertainty (EPU)	**0.011***** **(2.751)**
Ln (Total Assets)	0.943*** (3.897)
Total Debt/Total Assets	0.137 (0.320)
EBIT/Total Assets	-0.281 (-0.503)
Capital Expenditures/Total Assets	-8.662*** (-5.044)
R&D/Total Assets	0.490 (0.293)
Advertising Expense/Total Assets	1.112 (0.158)
Capital Expenditures/Total Assets	1.438 (1.552)
Dividends/Total Assets	10.543*** (2.864)
SG&A Expense/Total Assets	0.468 (0.929)
Fixed Assets/Total Assets	0.873 (1.318)
Time Trend	-1.160*** (-28.312)
Constant	411.383*** (325.898)
Firm Fixed Effects	Yes
Observations	101,070
R-squared	0.978

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Entropy balancing

This table presents the regression results with entropy balancing. The asset redeployability score is constructed by Kim and Kung (2017). For ease of exposition and interpretation, we multiply the asset redeployability score by 1000. The economic policy uncertainty (EPU) index is constructed by Baker et al. (2016).

	(1) Redeployability
Economic Policy Uncertainty (EPU)	**0.010***** **(2.850)**
Ln (Total Assets)	0.947*** (4.521)
Total Debt/Total Assets	0.394 (1.091)
EBIT/Total Assets	-0.232 (-0.722)
Capital Expenditures/Total Assets	-9.880*** (-7.349)
R&D/Total Assets	-0.600 (-0.490)
Advertising Expense/Total Assets	-0.956 (-0.187)
Capital Expenditures/Total Assets	1.016 (1.382)
Dividends/Total Assets	7.840*** (2.827)
SG&A Expense/Total Assets	0.554 (1.577)
Fixed Assets/Total Assets	0.806 (1.367)
Time Trend	-1.153*** (-30.036)
Constant	414.928*** (385.392)
Firm Fixed Effects	Yes
Observations	199,661
R-squared	0.975

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: Firm-fixed-effects instrumental-variable analysis using the Gulf War and the terrorist attack on 9/11 as exogenous shocks

This table shows the results of the instrumental-variable analysis based on the exogenous shocks from the Gulf War and the 9/11 terrorist attack. The asset redeployability score is constructed by Kim and Kung (2017). For ease of exposition and interpretation, we multiply the asset redeployability score by 1000. The economic policy uncertainty (EPU) index is constructed by Baker et al. (2016).

	(1)	(2)	(3)	(4)
	Full Sample	Full Sample	Propensity Score Matching	Entropy Balancing
	First Stage	Second Stage	Second Stage	Second Stage
	EPU	Redeployability	Redeployability	Redeployability
External Shocks (Gulf War and 9/11)	**16.200*** **			
	(224.600)			
EPU (Instrumented)		**0.270*** **	**0.256*** **	**0.274*** **
		(29.630)	**(16.872)**	**(29.342)**
Ln (Total Assets)	-1.015***	1.203***	1.197***	1.231***
	(-7.620)	(6.508)	(4.945)	(5.886)
Total Debt/Total Assets	-0.001	0.217	0.069	0.335
	(-0.003)	(0.671)	(0.161)	(0.929)
EBIT/Total Assets	0.699***	-0.286	-0.272	-0.229
	(3.120)	(-1.004)	(-0.485)	(-0.714)
Capital Expenditures/Total Assets	-9.719***	-7.244***	-7.596***	-8.588***
	(-7.855)	(-5.845)	(-4.442)	(-6.409)
R&D/Total Assets	1.464*	-0.517	0.536	-0.635
	(1.683)	(-0.478)	(0.320)	(-0.519)
Advertising Expense/Total Assets	44.218***	-1.731	0.407	-1.647
	(10.270)	(-0.358)	(0.058)	(-0.324)
Capital Expenditures/Total Assets	1.968***	0.711	1.453	0.992
	(3.095)	(1.038)	(1.568)	(1.350)
Dividends/Total Assets	-0.790	8.041***	10.830***	8.257***
	(-0.320)	(3.177)	(2.949)	(2.984)
SG&A Expense/Total Assets	0.186	0.720**	0.467	0.568
	(0.694)	(2.313)	(0.926)	(1.615)
Fixed Assets/Total Assets	0.170	0.271	0.740	0.648
	(0.400)	(0.492)	(1.118)	(1.099)
Time Trend	0.576***	-1.248***	-1.274***	-1.278***
	(29.549)	(-35.234)	(-30.889)	(-33.430)
Constant	96.232***	390.396***	387.026***	388.587***
	(142.389)	(302.401)	(207.140)	(292.352)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Observations	199,661	199,661	101,070	199,661
Adjusted R-squared	0.160	0.970	0.974	0.973

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: GMM dynamic panel data analysis

This table presents the result of a GMM dynamic panel regression analysis. The asset redeployability score is constructed by Kim and Kung (2017). For ease of exposition and interpretation, we multiply the asset redeployability score by 1000. The economic policy uncertainty (EPU) index is constructed by Baker et al. (2016)

	(1) Redeployability
Economic Policy Uncertainty (EPU)	**0.010***** **(7.336)**
Ln (Total Assets)	0.677*** (7.118)
Total Debt/Total Assets	0.080 (0.480)
EBIT/Total Assets	-0.370*** (-2.729)
Capital Expenditures/Total Assets	-3.453*** (-4.754)
R&D/Total Assets	-0.581 (-1.122)
Advertising Expense/Total Assets	12.592*** (4.993)
Capital Expenditures/Total Assets	-1.312*** (-3.606)
Dividends/Total Assets	-1.069 (-0.787)
SG&A Expense/Total Assets	0.187 (1.184)
Fixed Assets/Total Assets	-0.855*** (-3.481)
Time Trend	-0.441*** (-30.389)
Redeployability (t-1)	0.549*** (71.190)
Constant	185.260*** (57.424)
Firm Fixed Effects	Yes
Observations	154,845

z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7: Interaction effects

This table shows the regression results with the interaction terms. The asset redeployability score is constructed by Kim and Kung (2017). For ease of exposition and interpretation, we multiply the asset redeployability score by 1000. The economic policy uncertainty (EPU) index is constructed by Baker et al (2016)

	(1) Redeployability	(2) Redeployability
EPU × (Fixed Assets/Total Assets)	**0.031*****	
	(4.555)	
EPU × (Dividends/Total Assets)		**-0.275*****
		(-4.812)
Economic Policy Uncertainty	0.008	0.029***
	(1.637)	(8.907)
Ln (Total Assets)	0.940***	0.962***
	(5.072)	(5.192)
Total Debt/Total Assets	0.243	0.245
	(0.754)	(0.760)
EBIT/Total Assets	-0.353	-0.359
	(-1.238)	(-1.258)
Capital Expenditures/Total Assets	-8.185***	-8.378***
	(-6.566)	(-6.752)
R&D/Total Assets	-0.546	-0.565
	(-0.506)	(-0.523)
Advertising Expense/Total Assets	-1.739	-1.995
	(-0.357)	(-0.410)
Capital Expenditures/Total Assets	0.856	0.901
	(1.251)	(1.315)
Dividends/Total Assets	7.629***	35.345***
	(3.017)	(5.538)
SG&A Expense/Total Assets	0.702**	0.703**
	(2.257)	(2.255)
Fixed Assets/Total Assets	-2.834***	0.432
	(-2.984)	(0.784)
Time Trend	-1.129***	-1.131***
	(-31.532)	(-31.677)
Constant	416.743***	414.472***
	(404.182)	(423.690)
Firm Fixed Effects	Yes	Yes
Observations	199,661	199,661
Adjusted R-squared	0.970	0.970

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8: The effect of external governance: The takeover market

This table presents the regression result with an interaction term between EPU and the Takeover Index. The asset redeployability score is constructed by Kim and Kung (2017). For ease of exposition and interpretation, we multiply the asset redeployability score by 1000. The economic policy uncertainty (EPU) index is constructed by Baker et al. (2016).

	(1) Redeployability
EPU × The Takeover Index	**0.112*** **
	(2.685)
Economic Policy Uncertainty	0.027***
	(4.314)
The Takeover Index	-10.328*
	(-1.784)
Ln (Total Assets)	0.701***
	(2.933)
Total Debt/Total Assets	0.116
	(0.292)
EBIT/Total Assets	-0.596
	(-1.642)
Capital Expenditures/Total Assets	-5.741***
	(-3.517)
R&D/Total Assets	-0.026
	(-0.021)
Advertising Expense/Total Assets	-0.625
	(-0.118)
Capital Expenditures/Total Assets	1.027
	(1.208)
Dividends/Total Assets	1.930
	(0.633)
SG&A Expense/Total Assets	0.477
	(1.308)
Fixed Assets/Total Assets	-0.518
	(-0.716)
Time Trend	-1.054***
	(-22.082)
Constant	419.246***
	(335.095)
Firm Fixed Effects	Yes
Observations	128,699
Adjusted R-squared	0.956

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix

Table A1: Firm-fixed-effects instrumental-variable analysis using global economic policy uncertainty

The asset redeployability score is constructed by Kim and Kung (2017). For ease of exposition and interpretation, we multiply the asset redeployability score by 1000. The economic policy uncertainty (EPU) index is constructed by Baker et al. (2016).

	(1) EPU	(2) Redeployability
Global EPU	**0.958***** **(794.234)**	
Economic Policy Uncertainty (EPU)		**0.032***** **(12.062)**
Ln (Total Assets)	-0.121 (-1.603)	0.851*** (4.345)
Total Debt/Total Assets	-0.701*** (-4.456)	-0.784** (-2.382)
EBIT/Total Assets	0.220* (1.772)	-0.339 (-1.248)
Capital Expenditures/Total Assets	-13.521*** (-16.818)	-5.265*** (-3.642)
R&D/Total Assets	1.083** (2.141)	0.015 (0.015)
Advertising Expense/Total Assets	3.112 (1.284)	2.082 (0.344)
Capital Expenditures/Total Assets	2.112*** (5.654)	0.570 (0.750)
Dividends/Total Assets	-4.104*** (-3.142)	3.885 (1.535)
SG&A Expense/Total Assets	0.453*** (3.200)	0.388 (1.199)
Fixed Assets/Total Assets	0.292 (1.241)	0.680 (1.143)
Time Trend	0.195*** (15.539)	-1.030*** (-26.347)
Constant	5.121*** (12.844)	411.607*** (353.545)
Firm Fixed Effects	Yes	Yes
Observations	119,756	119,756
Adjusted R-squared	0.783	0.977

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1