

Digital adoption in Europe and the United States

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Motivation

Digitalisation has impact on:

- ▶ Firm performance
- ▶ Investment and innovation activities
- ▶ Competition

Questions

1. Where does EU stand in terms of digital adoption when compared to the US?
2. Is there a trend of digital polarisation in EU and US?
3. Can we characterize firms that are left behind and that forge ahead?
4. What are the impacts of digitalisation?
5. What are barriers to digitalisation?

What we do

- ▶ Use unique data
- ▶ Specify digital profiles
- ▶ See what kind of firms fall into which category
- ▶ Analyse firm performance and barriers

What we find

- ▶ We can confirm trend towards digital polarisation.
- ▶ Old-small firms are particularly likely to be non-digitally active.
- ▶ Digitalisation has impacts on employment, innovation and mark-ups.
- ▶ Finance is barrier in particular for non-digital firms in EU.

Outlook

- ▶ **Data**
- ▶ Characterisation of digital grid
- ▶ Performance
- ▶ Barriers
- ▶ Conclusion

EIBIS Digital and Skills Survey 2018 1/2

- ▶ EIB conducted a survey with 1,700 companies in the manufacturing and services sector in Europe and the US.

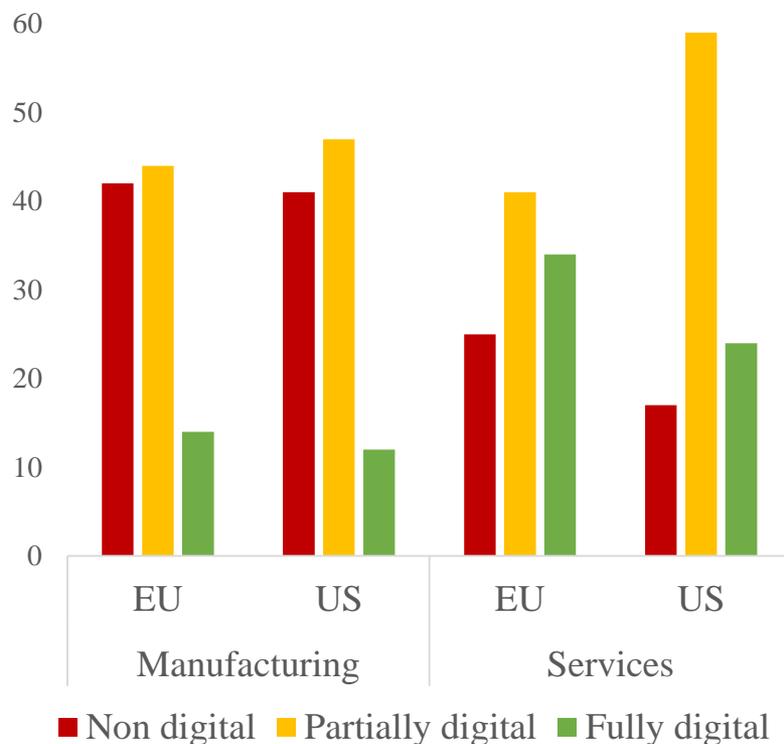
	Manufacturing	Services
Region		
EU	456	432
West and North Europe	198	198
South Europe	122	89
Central and East Europe	146	145
US	411	389
Northeast	93	83
Midwest	126	136
South	106	82
West	86	88
Size		
Micro (5-9)	143	172
Small (10-49)	291	333
Medium (50-249)	287	223
Large (250+)	146	93

EIBIS Digital and Skills Survey 2018 2/2

- ▶ We asked firms whether they have heard of, partially or fully implemented one of four technologies in the last years.
 - ▶ Manufacturing:
 - ▶ Advanced robotics
 - ▶ 3D-printing
 - ▶ IoT
 - ▶ Big Data
 - ▶ Services:
 - ▶ Automation of internal routines
 - ▶ Web-based applications for marketing and sales
 - ▶ Provision of digital products and services over the Internet
 - ▶ Big Data

Digitally active firms by sector and country

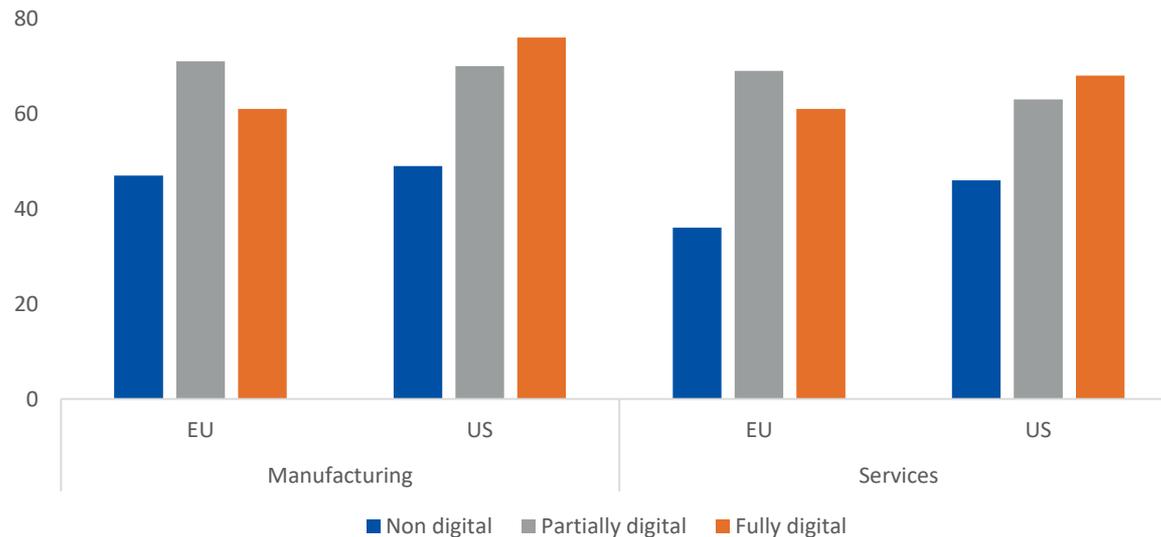
Share of firms (in %)



- ▶ Firm size matters for digital adoption.
- ▶ Firm age matters less.
- ▶ Service sector firms more digital.
- ▶ When comparing within same sector, size and age category, no significant differences between EU and US.

Digital investment plans

Share of firms (in %) that plan to increase their investment spend on digital technologies, by digital intensity

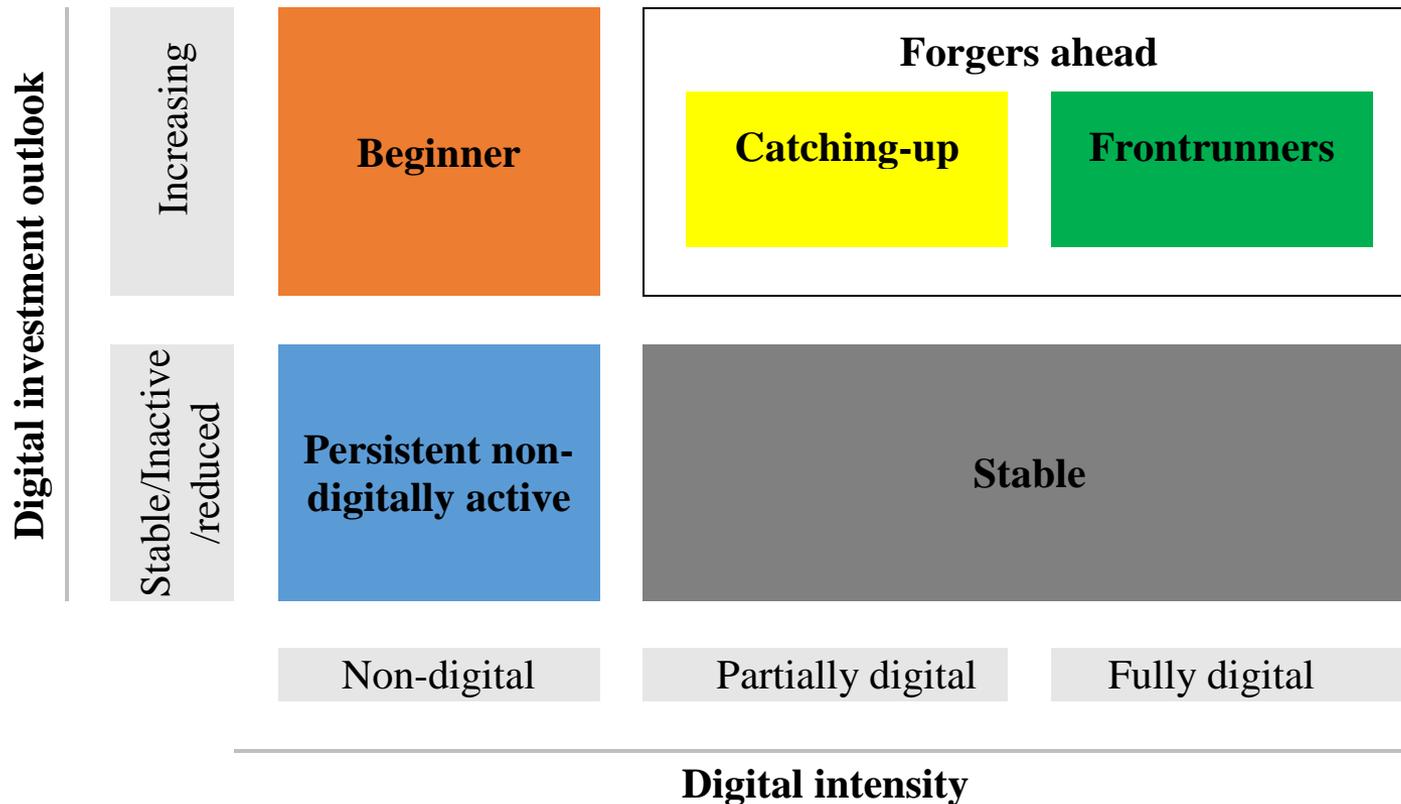


- ▶ Currently digitally active have a significantly higher probability (21% higher on average) to have digital investment expansion plans.
- ▶ Firms that are not (yet) digitally active are significantly less likely to have digital investment expansion plans compared to those that are already digitally active.
- ▶ Digital divide is not significantly larger in the EU than in the US or in services sector compared to manufacturing.

Outlook

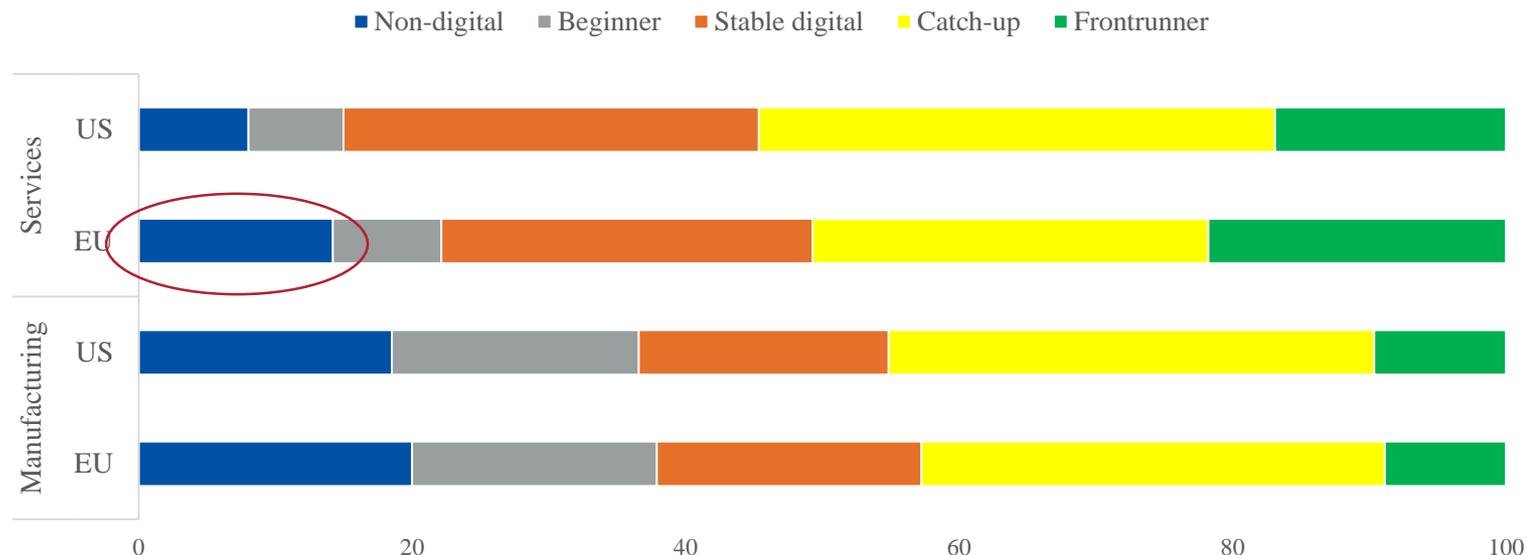
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Corporate digital divide categories



Digital divide by sector and country

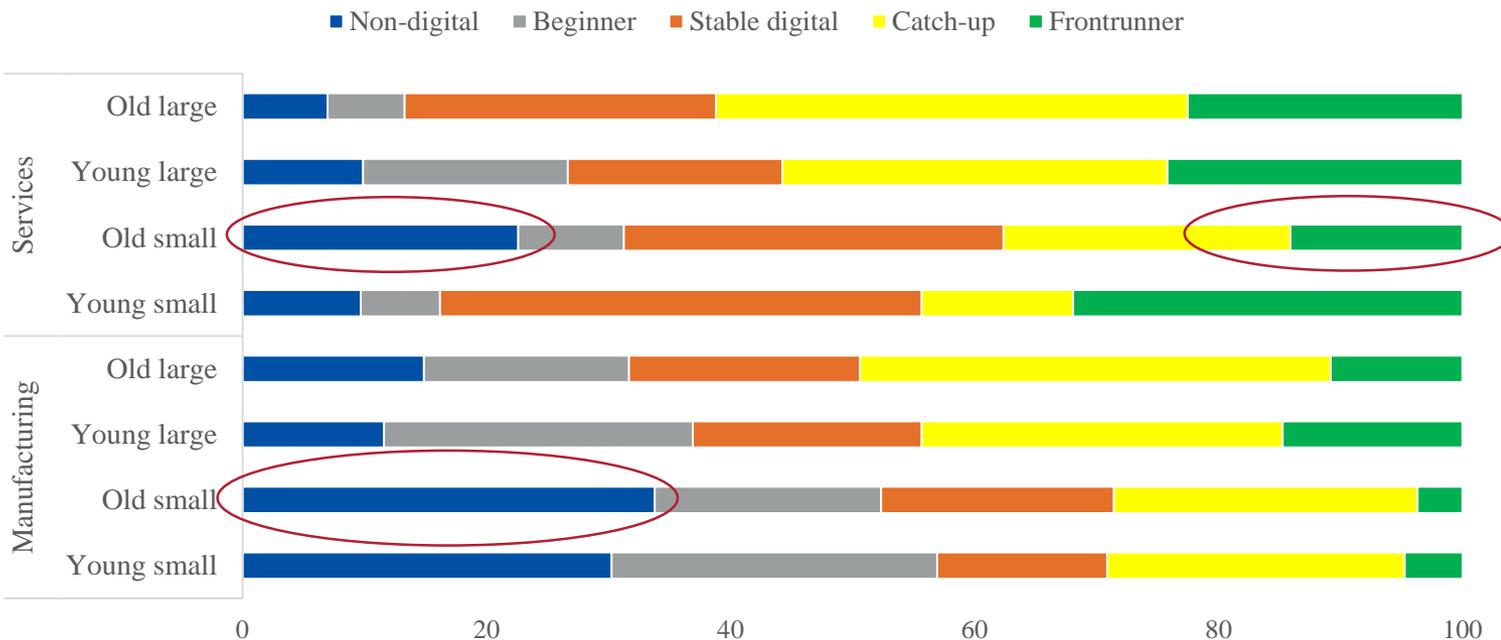
Digital divide, share of firms (in %)



- ▶ No large differences between the EU and the US on having manufacturing firms left behind on the digital divide grid. However, in the services sector, the EU seems to have more firms left behind in services than the US.
- ▶ There are also no large differences between the EU and the US in manufacturing on “frontrunners” or “catch-up”.
- ▶ In services, although the difference on “frontrunners” or “catch-up” is not significant either, the EU has somewhat more “frontrunners” compared to the US.

Digital divide by sector and age-size categories

Digital divide, share of firms (in %)



- ▶ Both in services and manufacturing, old small firms are significantly more likely to be on the wrong side of the divide. They are more likely to be persistently “non-digital” and less likely to be “frontrunners” or “catch-up”.

Probability to be “persistent non-digitally active” or “forging ahead”

	Persistent non-digitally active		Forging ahead		Frontrunner	
	Manuf.	Services	Manuf.	Services	Manuf.	Services
<i>Country group (omitted category: US)</i>						
EU	0.012 (0.036)	0.029 (0.029)	-0.020 (0.048)	0.016 (0.051)	-0.007 (0.029)	0.069* (0.042)
<i>Age-size category (omitted category: large firms, young or old)</i>						
Young small	0.155** (0.076)	0.021 (0.062)	-0.198*** (0.074)	-0.166* (0.095)	-0.063* (0.033)	0.083 (0.090)
Old small	0.191*** (0.039)	0.148*** (0.044)	-0.205*** (0.044)	-0.234*** (0.056)	-0.074*** (0.022)	-0.100** (0.044)
Sample size	773	770	773	770	773	770
R-squared	0.041	0.048	0.032	0.048	0.011	0.022

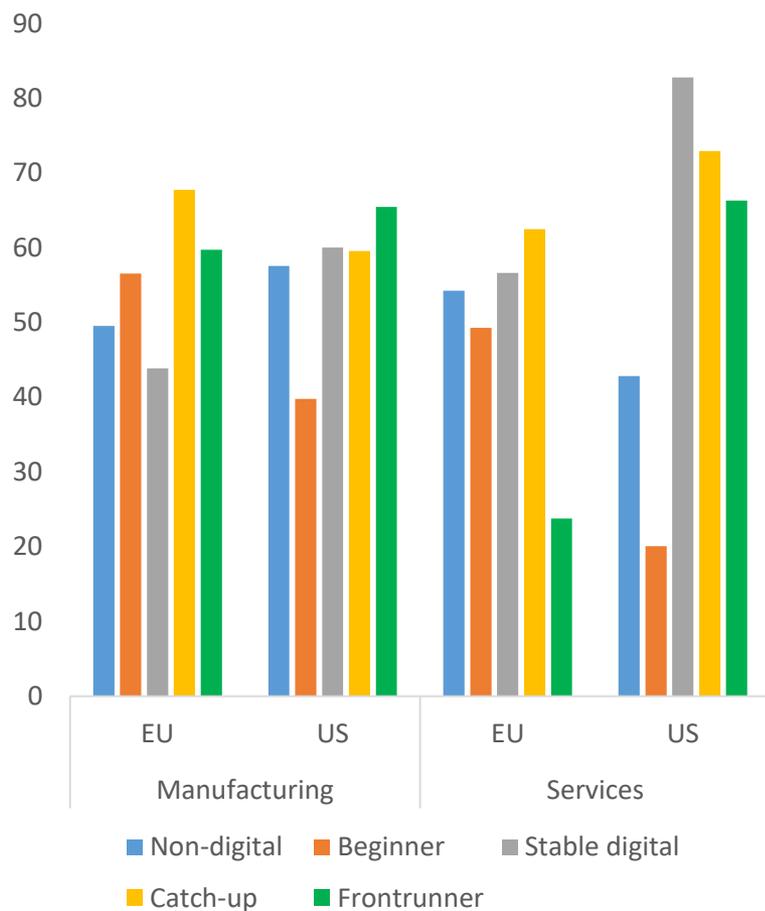
- ▶ Small young and old small manufacturing firms have, respectively, a 15% and 19% higher probability of being non-active compared to large firms.
- ▶ In services, old small firms have a 15% higher probability compared to large to be “persistent non-digitally active”.

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Employment Growth

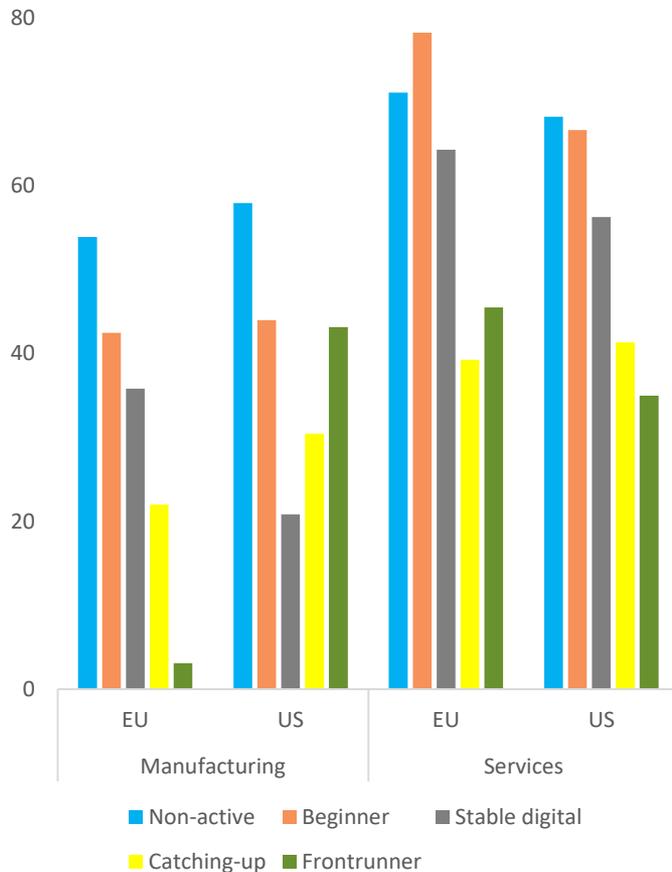
Share of firms (in %) with positive employment growth, by digital divide profile



Employment growth	
<i>Digitalisation profiles (omitted category: non-digital)</i>	
Beginner	0.198*** (0.072)
Stable	0.093 (0.060)
Catch-up	0.240*** (0.056)
Frontrunner	0.226*** (0.071)
<i>Sector (omitted category: manufacturing)</i>	
Services	-0.072* (0.038)
<i>Country group (omitted category: US)</i>	
EU	0.014 (0.036)
Young and small	-0.036 (0.067)
<i>Age-size category (omitted category: large firms, young or old)</i>	
Old and small	-0.169*** (0.038)
Sample size	1,412
R-squared	0.074

R&D and Innovation

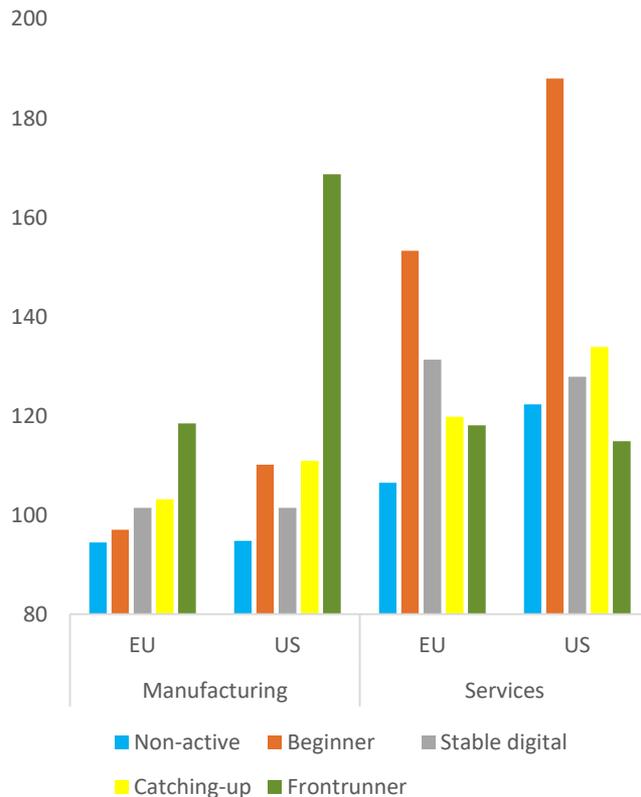
Share of non-innovation active firms (in %), by digital divide profile



	Non-innovator	Leading innovator
<i>Digitalisation profiles (omitted category: non-digital)</i>		
Beginner	-0.080 (0.082)	-0.024 (0.054)
Stable	-0.180*** (0.069)	0.083 (0.051)
Catch-up	-0.285*** (0.065)	0.077 (0.047)
Frontrunners	-0.293*** (0.084)	0.096* (0.057)
<i>Sector (omitted category: manufacturing)</i>		
Services	0.202*** (0.043)	-0.164*** (0.028)
<i>Country group (omitted category: US)</i>		
EU	-0.021 (0.043)	-0.004 (0.035)
<i>Age-size category (omitted category: large firms, young or old)</i>		
Young and small	0.102 (0.082)	-0.080** (0.033)
Old and small	0.069 (0.044)	-0.054* (0.028)
Sample size	1,023	1,023
R-squared	0.089	0.076

Mark-ups

Mark-up index, by digital divide profile



Note: For each digital divide profile, the mark-up index is standardised with the average mark-up in of all firms in the sample (e.g. average mark-up of EU manufacturing firms with profile “frontrunner”/average mark-up of all firms*100)

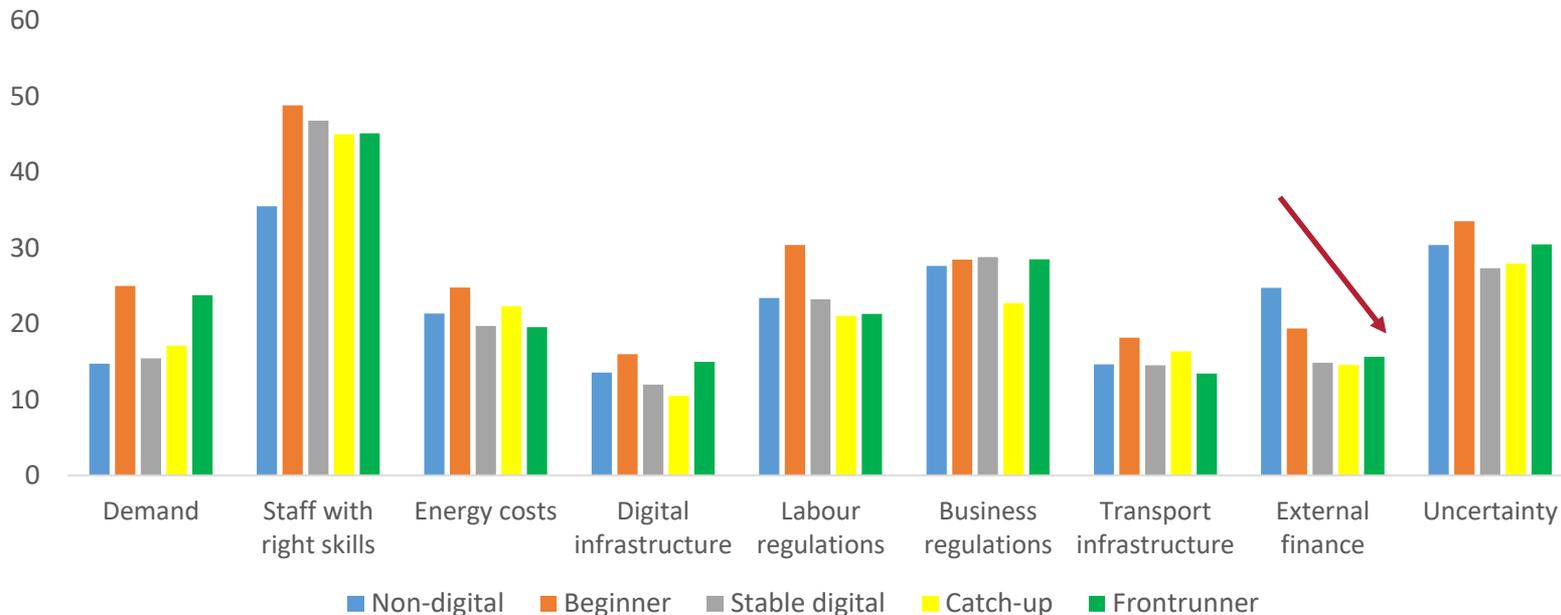
	Mark-up	Top quintile mark-up
<i>Digitalisation profiles (omitted category: non-digital)</i>		
Beginner	0.161** (0.066)	0.136** (0.068)
Stable	0.127*** (0.046)	0.104** (0.047)
Catch-up	0.103** (0.042)	0.097** (0.042)
Frontrunners	0.149** (0.070)	0.199*** (0.071)
<i>Sector (omitted category: manufacturing)</i>		
Services	0.217*** (0.048)	-0.063 (0.040)
<i>Country group (omitted category: US)</i>		
EU	-0.086** (0.041)	-0.073* (0.042)
<i>Age-size category (omitted category: large firms, young or old)</i>		
Young and small	0.014 (0.092)	0.032 (0.069)
Old and small	-0.054 (0.038)	-0.007 (0.034)
Sample size	844	844
R-squared	0.084	0.035

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Perceived barriers for digital investment

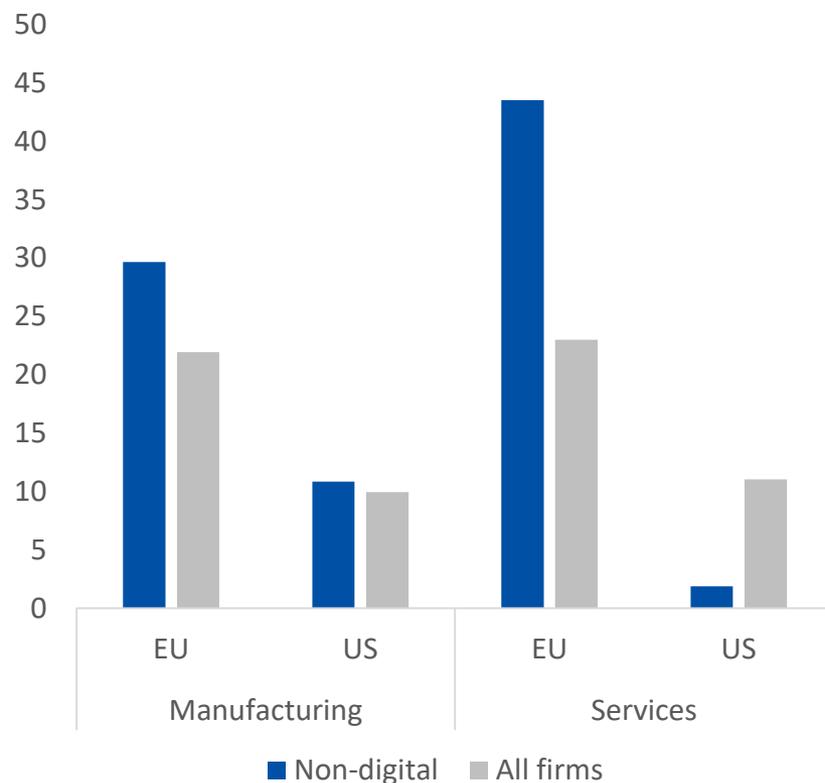
Share of firms (in %)



- ▶ Availability of “staff with the right skills” is reported the most often as major barrier.
- ▶ Also “uncertainty” about the future and “business regulations” score high for this group.
- ▶ The barrier which persistent “non-digital” firms score higher than other firms is “access to finance”.

Share of firms that report the availability of external finance as a major obstacle to investment

Share of firms (in %)



- ▶ Difference between EU and US is most pronounced in the services sector.
- ▶ This suggests addressing “access to finance” as a prime candidate for EU policy makers to unlock their “persistent non-digitally active” firms.

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Conclusions

- ▶ Data confirms the trend toward digital polarisation and a growing digital divide in the corporate landscape.
- ▶ Old small firms are significantly less likely to be innovative.
- ▶ While availability of skilled staff is the most important major barrier for digital investments, the “persistent non-digitally active” firms are in general more complacent.
- ▶ An exception is the access to finance, suggestive for EU policy makers to strengthen the power of the single market and competition policy to ensure competitive markets that motivate firms to digitally “forge ahead”.